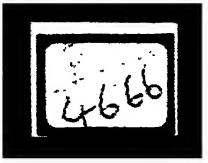
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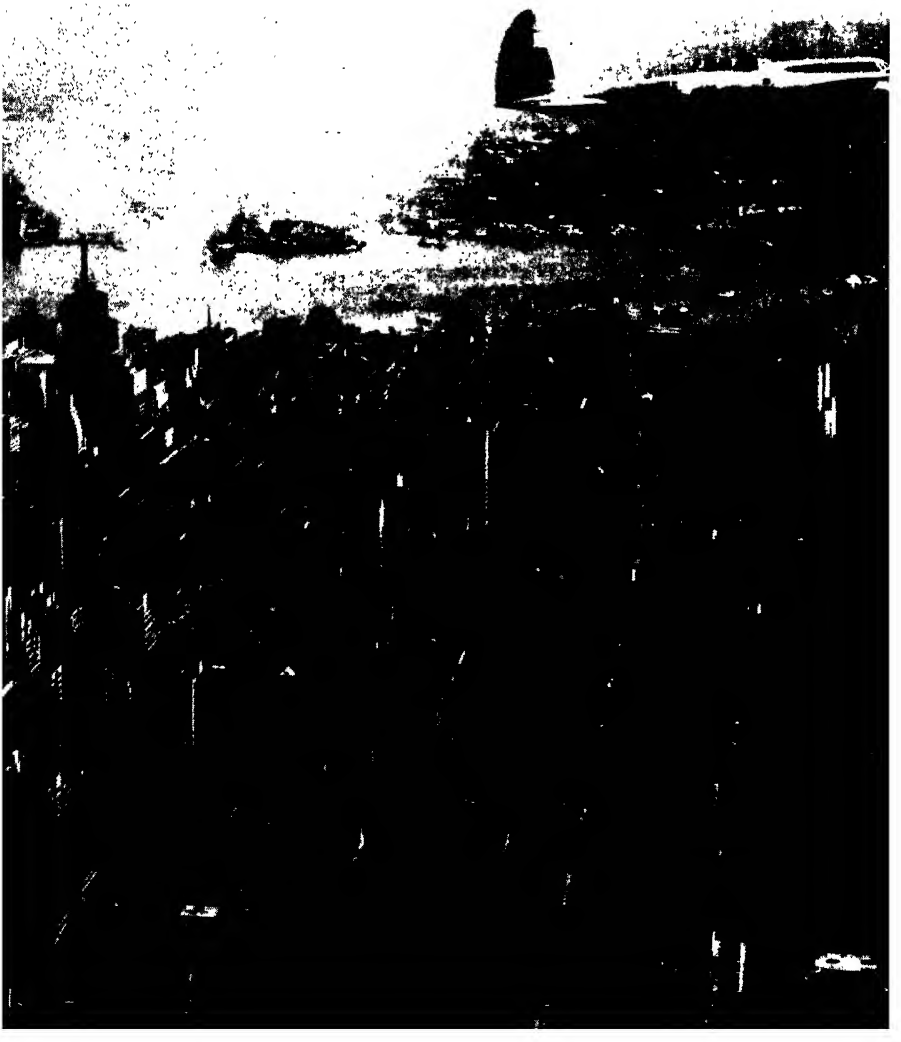

76th CONGRESS
1st SESSION

SENATE

DOCUMENT
NO. 91

THE ARMY OF THE UNITED STATES

THE ARMY OF THE UNITED STATES, ITS COMPONENTS, ITS ARMS, SERVICES, AND BUREAUS, ITS MILITARY AND NONMILITARY ACTIVITIES

PRESENTED BY MR. SHEPPARD

REFERRED TO THE COMMITTEE ON PRINTING, JUNE 7, 1939

PREPARED BY THE WAR DEPARTMENT FOR MORRIS SHEPPARD, CHAIRMAN OF THE COMMITTEE ON MILITARY AFFAIRS OF THE SENATE

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SENATE CONCURRENT RESOLUTION No. 22

Seventy-Sixth Congress

SUBMITTED BY MR. SHEPPARD

Concurrent Resolution

Resolved by the Senate (the House of Representatives concurring), That the manuscript submitted to the Senate by Senator Morris Sheppard on June 7, 1939, and referred to the Committee on Printing, containing a general description of the Army of the United States, its components, its arms, services, and bureaus, its military and nonmilitary activities, be printed, with illustrations, as a public document; and that ten thousand seven hundred additional copies shall be printed, with illustrations, and bound, as may be directed by the Joint Committee on Printing, of which two thousand five hundred copies shall be for the use of the Senate and eight thousand copies for the use of the House of Representatives, and one hundred copies to each of the Committees on Military Affairs of the two Houses of Congress.

Adopted June 30, 1939.

Attacking infantrymen.

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REFERENCES

THIS BOOK contains a general description of the Army of the United States, its components, its arms, services, and bureaus, and its military and nonmilitary activities. Many other Government publications contain more detailed information on certain phases of the Army, among them the following:

The Official Army Register, issued annually, lists all officers on the active and retired lists of the Regular Army, with brief biographical data, and gives a list of distinguished cadets, casualties among officers active and retired, the Roll of Honor, authorized strength of the Army, and pay of the Army.

The Army List and Directory, published semiannually, lists the army areas, corps areas, and departments; the stations of all active units of the Regular Army; the posts, camps, and stations of the Regular Army, whether garrisoned or not; officers detailed with the National Guard, Organized Reserves, and Reserve Officers' Training Corps, and the Army Recruiting Service, and their stations; the schools, colleges, and universities with R. O. T. C. units; military attachés; general officers; the General Staff Corps; all officers on the active list of the Regular Army, as to branch and relative rank, and alphabetically with present addresses; and changes in the active list of Regular officers.

The Congressional Directory, published annually, contains, among extensive information on the personnel of Congress and the judicial and executive branches of the Government, a list of the members of the Military Affairs

Committee and the Appropriations Committees of the Senate and House of Representatives, a list of the principal officers of the War Department in Washington, and a description of their official duties.

The Official National Guard Register lists the stations of the National Guard units of the 48 States, the District of Columbia, Puerto Rico, and Hawaii; and lists the officers of each unit with brief biographical data.

The Official Register of the United States, published annually, lists the members of Congress and approximately 10,000 of the principal officials of the Government, including military and civilian officers of the War Department.

The Annual Report of the Chief of Engineers contains extensive information on active river and harbor and flood control projects.

Decorations, United States Army, 1862–1926, lists all members of the Army decorated during that period and gives a brief description of the action for which each decoration was awarded.

The Annual Report of the Secretary of War, including the annual reports of The Assistant Secretary of War and the Chief of Staff, describes the state and progress of the Army of the United States.

The Annual Report of the Chief of the National Guard Bureau describes the state and progress of the National Guard.

These and other military publications are on sale by the Superintendent of Documents, United States Government Printing Office, Washington, D. C., from whom price lists can be obtained.

COVER, FRONTISPIECE, AND ENDPIECE ILLUSTRATIONS

Front cover: 3-inch Coast Artillery antiaircraft gun.

Front endpiece: Boeing *B–17* bombardment airplanes over New York City.

Frontispiece: Infantry tank in Washington parade.

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Back cover: Cavalry combat car in smoke.

Infantryman aiming rifle.

CHAPTER I

THE ARMY OF THE UNITED STATES

THE Constitution gives to Congress the power to raise and support armies and designates the President as Commander in Chief. By the National Defense Act of June 3, 1916, as later amended by other laws, Congress constituted the Army of the United States in six components: the Regular Army, the National Guard of the United States, the National Guard while in the service of the United States, the Officers' Reserve Corps, the Organized Reserves, and the Enlisted Reserve Corps. For simplicity only three components—the Regular Army, the National Guard, and the Organized Reserves—will be generally referred to in this book.

Under the President, the Secretary of War is the head of the War Department, the Government department charged with managing the Army. The Assistant Secretary of War has specific duties prescribed by law and assigned to him by the Secretary of War, and acts for the Secretary of War during his absence. The Chief of Staff is the highest ranking officer of the Army, and the adviser to the Secretary of War on military matters.

The War Department not only has charge of the administration and training of the Army in preparation for possible war, but it also supervises or directs a number of activities not purely military. For example, it has the responsibility of operating the Panama Canal and it directs such public works as the improvement of rivers and harbors.

Each component of the Army consists of officers and enlisted men divided into combat arms, such as the Infantry, Air Corps, and Field Artillery, and into services, such as the Medical Department and the Quartermaster Corps. Each arm, service, and bureau has a "Chief" in Washington. The arms, services, and bureau are as follows:

Arms

Infantry	Coast Artillery Corps	Corps of Engineers
Cavalry	Air Corps	Signal Corps
Field Artillery		

Services

Adjutant General's Department	Finance Department
Inspector General's Department	Medical Department
Judge Advocate General's Department	Ordnance Department
	Chemical Warfare Service
Quartermaster Corps	Corps of Chaplains

Bureau

National Guard Bureau

In general the arms do the actual fighting in battle, and the services assist the arms by supplying them with food, clothing, weapons, ammunition, and other supplies, and by furnishing transportation, medical care, and other assistance.

Some of the services, however, may come into direct contact with the enemy and then have to fight for their own protection. On the other hand, a few of the arms, particularly the Corps of Engineers and the Signal Corps, may not only engage directly in combat with the enemy but furnish certain special supplies to the other arms.

A few of the services are composed entirely of Army officers; the other arms and services consist of both officers and enlisted men, and are organized into units of different sizes running from squads of a dozen men or less up to regiments or brigades of several thousand men. The largest unit completely organized in peace is the division, which is composed of infantry or

cavalry and other arms and services, as described in later sections of this book. Still larger units are, of course, organized for maneuvers or in our wartime Army—corps, made up of several divisions and additional troops, and field armies which may be formed of several corps and other troops.

The table on pages 4, 5, and 6 lists the Army units from smallest to largest and gives their approximate war strength. In general, each unit comprises two or more of the units listed next above. For example, a section or platoon is composed of several squads, and a company, troop, or battery, is in turn composed of several platoons, and so on down the units listed in the left-hand column of the table.

Infantry officer using portable radio.

Units of the Army

Units	*War strength (approximate)*	*Rank of commander (normal)*	*Other names for units of similar size*	*Arms and services composing the unit*
Squad	12 or less	Sergeant or corporal.		Found in nearly all arms and services. Composed only of troops from a single arm or service, except that chaplains and medical personnel form part of any regiment of any arm or service.
Section	20–25	Sergeant		
Platoon	40–55	Second or first lieutenant.	Called "subflights" in the Air Corps.	
Company	80–200	Captain	Called "batteries" in the Field and Coast Artillery; "troops" in the Cavalry; "flights" in the Air Corps.	
Battalion	300–850	Lieutenant colonel or major.	Called "squadrons" in the Cavalry and Air Corps.	
Regiment	800–3,100	Colonel	Called "groups" in the Air Corps.	
Brigade	5,000–6,300	Brigadier general.	Called "wings" in the Air Corps.	Found only in the Infantry, Cavalry, Field Artillery, and Coast Artillery The triangular (streamlined) infantry division contains no brigades.

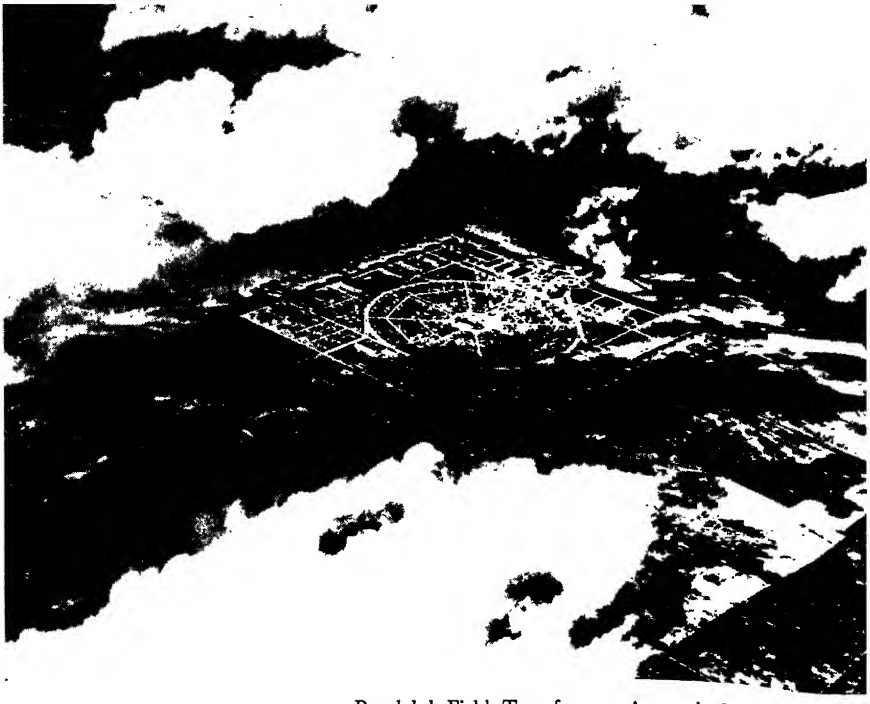
Units of the Army

Units	*War strength (approximate)*	*Rank of commander (normal)*	*Other names for units of similar size*	*Arms and services composing the unit*
Division (There are two types of infantry division—the triangular (streamlined) division and the square division, which are described in the section on the Infantry in Chapter II—and one type of cavalry division. In infantry divisions, infantry forms the basic fighting strength, and in cavalry divisions the main combat arm is cavalry.)	Triangular (streamlined) infantry division, 12,500; square infantry division, 18,500; cavalry division, 10,000.	Major general.		Composed of brigades, regiments, and battalions (cavalry divisions and square infantry division), or of regiments and battalions (triangular infantry division), from many different arms and
Corps (often called "army corps" to distinguish it from arms and services which have the word "corps" as part of their names, such as the Corps of Engineers and the Coast Artillery Corps).	65,000–90,000.	Lieutenant general.	.....	Composed of infantry divisions of both types or of cavalry divisions, and of additional brigades, regiments, and battalions, from many different arms and services. Contains officers of all arms and serv-

Units of the Army—Continued

Units	*War strength (approximate)*	*Rank of commander (normal)*	*Other names for units of similar size*	*Arms and services composing the unit*
Army (often called "field army" to distinguish it from the whole Army of the United States, of which such a unit forms only a part).	200,000–400,000.	General....	.....	Composed of corps, and of additional units from several arms and services.

Infantry tank mounting obstacle.



Randolph Field, Tex., from an Army airplane.

Congress and the Army

Congress, under the Constitution, has the power to "raise and support armies" for the defense of our country. Thus Congress determines the size of the Army and each of its three components and appropriates money each year to maintain the Military Establishment. The Senate and the House of Representatives each have a Committee on Military Affairs and a Committee on Appropriations. Practically all legislation affecting the Army of the United States, except appropriations, is referred by each House to its Committee on Military Affairs for study and report.

Before presentation to Congress, legislation proposed by the War Department is first processed through the Bureau of the Budget in order to determine whether or not it is in accord with the program of the President. If it is not in accord with that program, it is not submitted to Congress on the initiative of the War Department. Other legislation affecting the War Department, proposed by individual Members of Congress, is referred to the appropriate committee and the War Department is generally requested by the committee to submit a report upon it. These reports are similarly processed through the Bureau of the Budget with the view of ascer-

taining the relationship of the proposed legislation to the President's program.

Legislation to support the Army by money appropriations is handled in a similar manner by the Committees on Appropriations of the Senate and House of Representatives which are guided by existing laws. The Committees on Appropriations have within their membership various subcommittees, one of which, the War Department Subcommittee, is charged specifically with studying and reporting upon appropriations for the Army.

Each year the War Department General Staff under the direction of the Deputy Chief of Staff draws up instructions to guide the chiefs of the arms, services, and bureaus in preparing estimates of the cost of the activities for which they are responsible. The preparation of these estimates begins about 15 months prior to the beginning of the fiscal year (July 1) for which the funds are required. After approval by the Secretary of War, the Budget Officer for the War Department (the Chief of Finance) submits the War Department estimates to the Bureau of the Budget. In accordance with law all departments of the Government must submit their estimates to the Bureau of the Budget by September 15 of each year. The Director of the Bureau of the Budget studies the estimates and holds hearings on them. At these hearings the War Department estimates are defended by the chiefs of arms, services, and bureaus who prepared them. The Director of the Bureau of the Budget is responsible directly to the President to whom he recommends any changes in the estimates that he deems proper. After action by the President, he then incorporates the estimates of all Government agencies into the President's budget for submission to Congress.

Since the Constitution requires that legislation for appropriations must originate in the House of Representatives, the work of studying the budget estimates and of preparing bills for Army appropriations is done by the War Department Subcommittee of the House Committee on Appropriations. This committee is not bound by the totals given in the President's budget, though generally it follows the budget rather closely.

In its study of the estimates, this War Department Subcommittee holds hearings at which the Secretary of War, the Assistant Secretary of War, the Chief of Staff, his assistants, and the chiefs of arms, services, and bureaus may be called. These War Department representatives are invited by the subcommittee to comment upon the particular estimates which they prepared and to answer questions asked by the subcommittee. The subcommittee often invites persons not in the War Department to appear and discuss plans of national defense in which they may have a particular interest.

At the conclusion of the hearings, the subcommittee considers the testimony it has heard, drafts the War Department appropriation bill, and

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Field Artillery in review at Schofield Barracks, Hawaii.

then submits it for the full Committee on Appropriations to consider. As adopted by this Committee, the appropriation bill is next presented to the House of Representatives, usually by the chairman of the subcommittee. After passing the House, the bill goes in the usual manner to the Senate where it is referred for study to the Senate Committee on Appropriations. The War Department Subcommittee of that committee studies the bill, holds hearings on it, and amends it as it sees fit before submitting it to the Senate for consideration. Eventually, after all differences are reconciled and both Houses pass the same bill, it is submitted to the President for his approval. After approval the bill becomes a law which authorizes the Treasury to pay out the funds carried in the act for the expenses of the Army for the fiscal year that the act covers.

The Secretary of War

The Secretary of War is head of the War Department, charged with administering and managing the department in all of its functions, military and nonmilitary. He supervises all estimates for appropriations for Army expenses, all expenditures of money appropriated by Congress for the support, transportation, and maintenance of the Army, and all expenditures for civil works placed under his direction by Congress. He carries out the provisions of the National Defense Act, and is responsible for the protection of our seacoast, our harbors, and our cities; for the development of improved weapons and equipment; for the instruction, discipline, and morale of all components and military training activities of the Army; for the defense, maintenance, and operation of the Panama Canal; and for the administration, government, and defense of insular possessions that come under the War Department. The Secretary of War also directs the activities of the Corps of Engineers in forming and carrying out plans for controlling floods and improving waterways and harbors for navigation, and recommends plans for such improvements to Congress, and makes contracts for their execution. Up to July 1, 1939, the Secretary of War supervised the activities of the Inland Waterways Corporation and the Bureau of Insular Affairs, including jurisdiction over the civil affairs of the Philippine Islands. On that date these activities were transferred to other Government agencies. He is president of the National Forest Reservation Commission, and also supervises the maintenance and conduct of the United States Military Academy at West Point. He is responsible for many of the administrative functions in connection with the Civilian Conservation Corps.

The Secretary of War is also responsible for surveys of international

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Coast Artillery 14-inch railway gun.

Air Corps Seversky, *P–35*, pursuit airplanes at Selfridge Field, Mich.

boundary waters, the interoceanic survey (Nicaragua Canal route), and the construction of national monuments and memorials. He is also charged with the establishment of harbor lines, approval of plans for constructing bridges, and the issue of permits for other construction upon navigable waters; investigation, in cooperation with the Federal Power Commission, of water-power projects; the removal of wrecks from navigable waters; the regulation of drawbridge operation; the establishment and regulation of anchorage grounds; the regulation of the use of navigable waters, the preservation of the American Niagara Falls; and the administration of United States participation in the Niagara Control Board. He is also responsible for all matters relating to leases, revocable licenses, and all other privileges on lands under control of the War Department.

The Assistant Secretary of War

The Assistant Secretary of War is charged with supervision of the procurement of all military supplies for the Army of the United States, including the manufacture at Government arsenals or Government-owned factories of all supplies these arsenals and factories can produce economically. He is charged with insuring adequate provision for the mobilization of matériel and industrial organizations essential to wartime needs. He supervises and acts upon the purchase, lease, and sale of real estate under War Department control, including leases, licenses, and rights-of-way to others; the sale of surplus supplies, equipment, plants, and land or other facilities. He supervises and acts upon claims, foreign or domestic, by or against the War Department; clemency cases in litigation or remission of sentence by court-martial; matters relating to national cemeteries; activities relating to the National Board for the Promotion of Rifle Practice and Civilian Marksmanship; permits for the construction of bridges and

Soldiers at barracks at The Infantry School, Fort Benning, Ga.

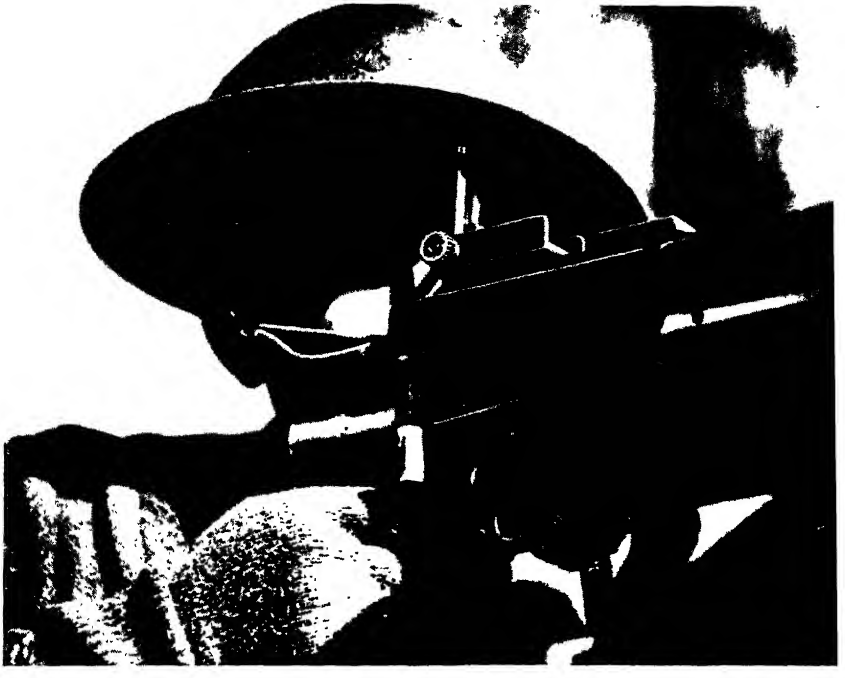
Field artillerymen firing 75-mm. howitzer.

submarine cables; and the use of patent rights by the War Department and the Army.

The current procurement branch of the office of the Assistant Secretary of War deals with all matters relating to supervision of procurement of supplies in time of peace. The planning branch is responsible for plans for wartime supply procurement and for industrial mobilization planning.

The Assistant Secretary of War supervises the Army Industrial College, and is the Army member of the Army and Navy Munitions Board.

Soldier firing automatic rifle.



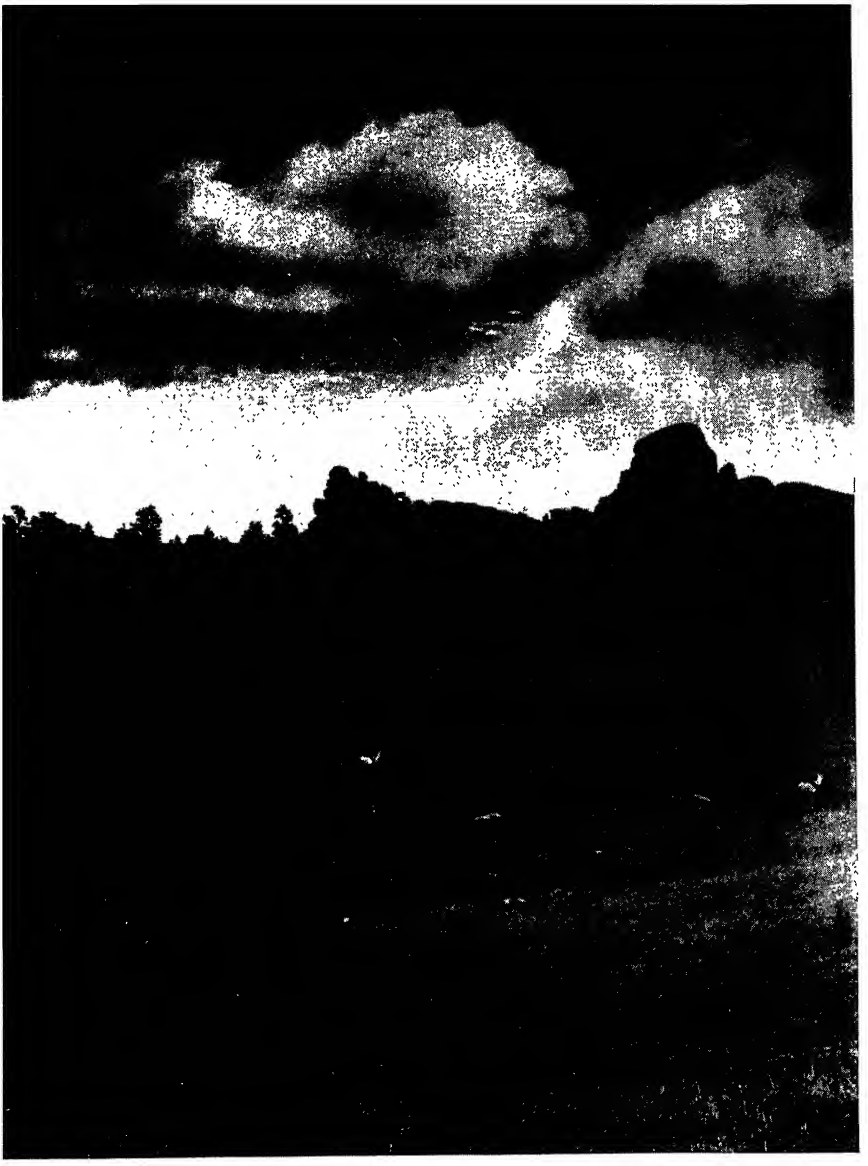
Adjusting caliber .50 machine gun.

The War Department General Staff

The Secretary of War is assisted in military matters by the War Department General Staff composed of selected officers of the Regular Army, National Guard, and Organized Reserves. The War Department General Staff is charged with the preparation of plans and policies for recruiting, mobilizing, organizing, supplying, equipping, paying, and training the Army for use in the national defense. It investigates and reports upon questions affecting the efficiency of all components of the Army of the United States.

The staff organization of the Army is concerned entirely with forming plans and policies, with serving the Army in an advisory capacity, and with preparing directives of the Secretary of War for carrying out the plans and policies that are finally adopted.

The Chief of Staff, the immediate adviser to the Secretary of War on all military matters, heads the War Department General Staff. He is charged by the Secretary of War with planning, developing, and executing the Army's program for national defense. As the agent of, and in the name of the Secretary of War, he issues orders to insure that the plans of the War



Infantry machine-gun unit in maneuvers.

Department are harmoniously executed by all branches and agencies in all components of the Army.

The Deputy Chief of Staff assists the Chief of Staff and acts for him in his

absence. He is charged with supervision of the activities of the five divisions of the War Department General Staff, each of which is headed by an Assistant Chief of Staff.

The Personnel Division, known as G–1, prepares plans and policies and supervises activities that concern the officers and enlisted men of the Army as individuals. These activities deal with procuring, classifying, assigning, promoting, paying, transferring, retiring, and discharging, in peace and in war, all personnel of all components and training activities of the Army. This division is also concerned with measures for conserving manpower, with replacements of personnel, Army regulations, uniform regulations, decorations, religious and recreational work, cooperation with the Red Cross and similar organizations except for medical care and hospitals, regulations concerning enemy aliens, prisoners of war, and other matters.

The Military Intelligence Division, known as G–2, has duties that relate to collecting, studying, analyzing, and furnishing all kinds of military information. It supervises Army activities dealing with military surveys, maps, and photographs, codes and ciphers, and translations. Military attachés, observers, foreign-language students, and intelligence personnel of all Army units, are other matters dealt with by this division. It also directs a Public Relations Branch which prepares and issues War Department press releases and handles other matters concerning relations with the press and with the public at large.

The Operations and Training Division, known as G–3, is charged, in general, with planning and supervising activities with regard to the organized

Field artillerymen loading 155-mm. gun under camouflage net.

training and operation of the military forces, except for those matters expressly assigned to the War Plans Division. Other activities dealt with by this division are the location of units of the Regular Army and the Organized Reserves, educational and vocational training, training regulations, the special and general service schools, military training in civilian institutions and in civilian training camps, movement of troops, replacement priorities, and military police.

The Supply Division, known as G–4, in general has duties which relate to supplying the Army, and to planning for all equipment, buildings, storage, transportation, and distribution of supplies, and for other facilities. This division is also concerned with traffic control, hospitalization and evacuation of sick and wounded men and animals, inventions, responsibility and accountability for Army property, procurement of real estate, and construction and maintenance of buildings.

The War Plans Division is, in general, charged with duties relating to plans for the use of military forces in a war. It also supervises the location and armament of coast and land fortifications; and it estimates the military forces that would be required and the times at which they would be needed in all possible circumstances of national defense.

At present there are about 120 officers on duty with the War Department General Staff, including five National Guard officers and five Reserve officers. These officers are of grades from captain to major general. In each division of the War Department General Staff, the duties listed above are assigned to officers especially qualified by training and experience for the specific work. The War Department General Staff has a flexible and efficient organization. Much of its activity is carried on through direct conference between the different staff divisions and between the staff itself and the offices of the chiefs of the arms, services, and bureaus.

The Chief of Staff holds the temporary rank of general while in office. The chiefs of most arms, services, bureaus, and War Department General Staff divisions are major generals or brigadier generals.

The War Council and Other Activities

War Department policies are drawn up by the War Council, which consists of the Secretary of War, the Assistant Secretary of War, and the Chief of Staff. The War Council meets daily to consider policies affecting military problems.

The reviewing agency of the War Department is the General Council, which periodically reviews and coordinates all War Department projects

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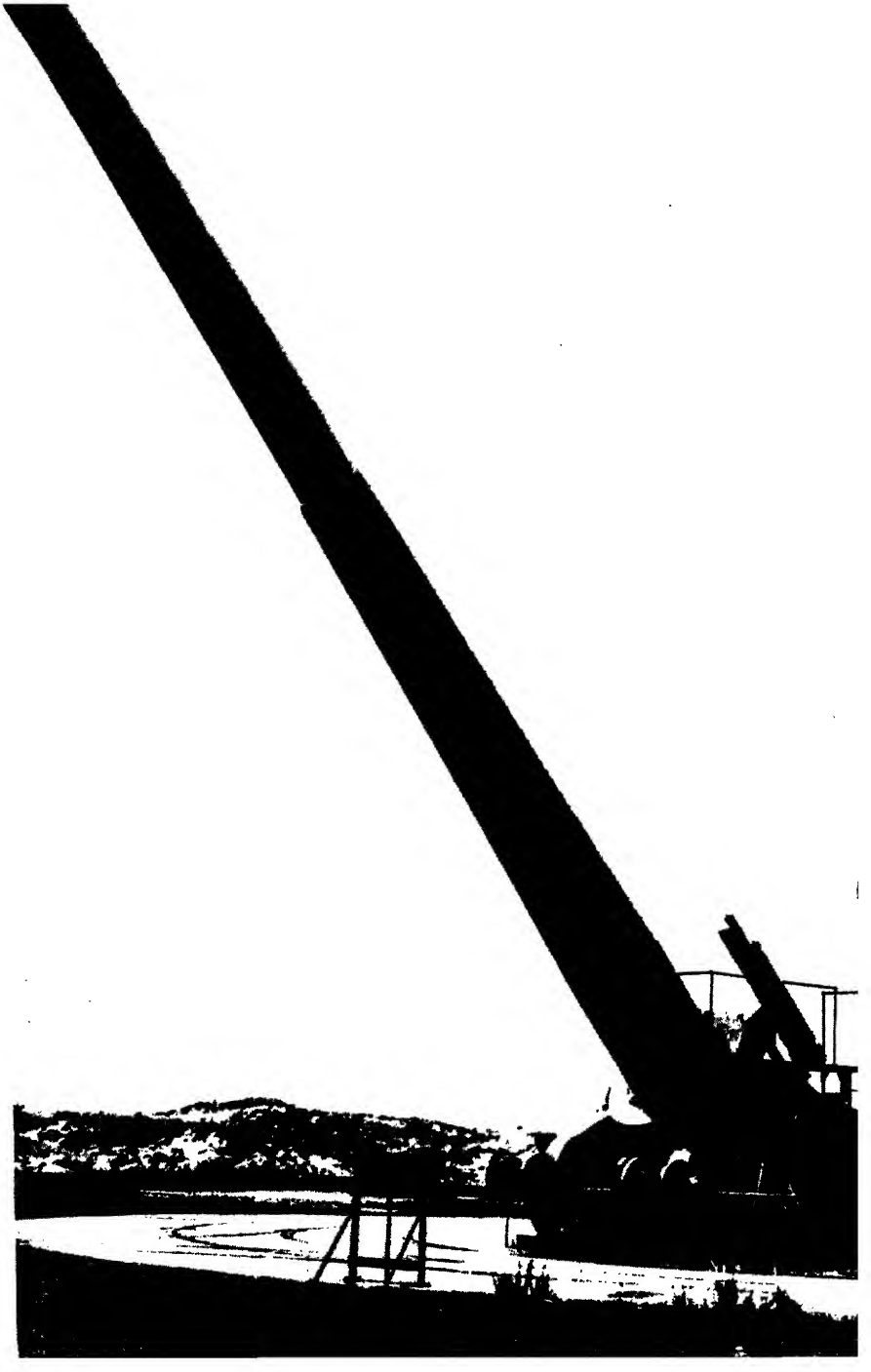
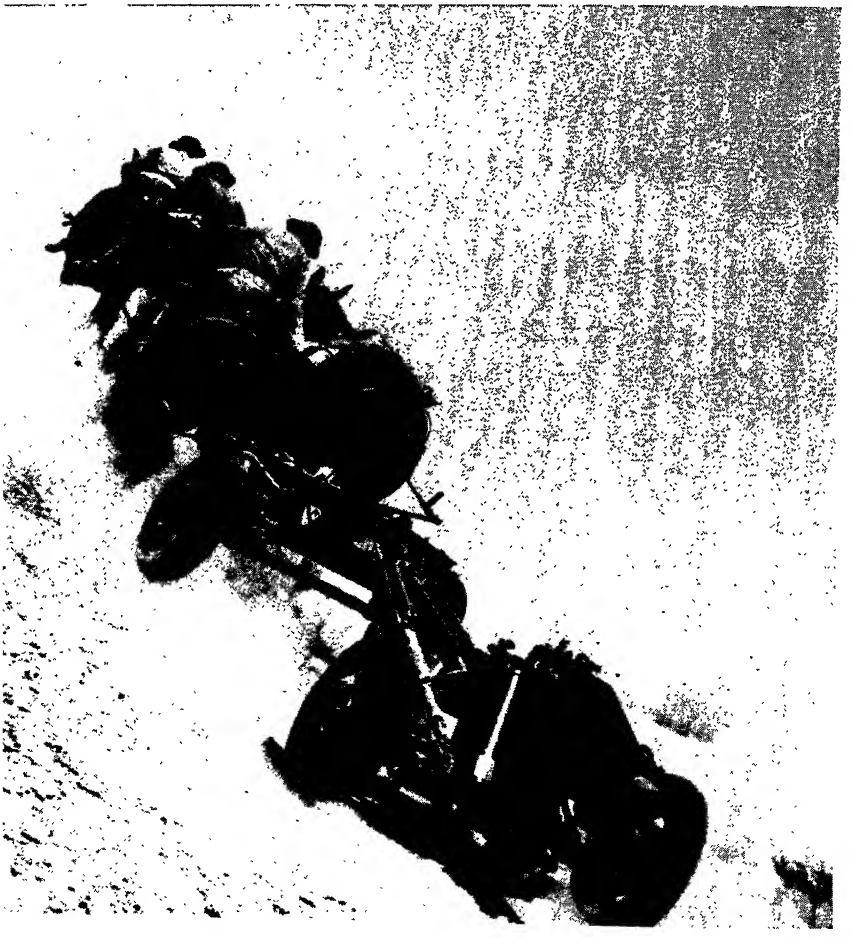
Coast Artillery 16-inch harbor-defense gun.



and passes on matters of current policy. This agency functions under the Chief of Staff and is composed of the Deputy Chief of Staff as president, the Assistant Chiefs of Staff, and the executive officer of the Assistant Secretary of War. The chiefs of the arms and services, the Commandant of the Army War College, the Chief of the National Guard Bureau, and the Executive for Reserve Affairs may also sit as members of this Council.

The Budget and Legislative Planning Branch of the War Department, under the Deputy Chief of Staff, is charged with the preparation of plans and policies in connection with legislation and military estimates for funds; with processing budgetary matters in the General Staff, reports concerning legislation, and requests for legislation that come within the purview of the General Council, or that are referred to the General Staff, and with such other duties as the Chief of Staff may prescribe.

Field Artillery 75–mm. howitzer of cavalry division.



Infantry deploying for combat.

The Protective Mobilization Plan

It is the military policy of the United States to maintain in time of peace, a small, completely equipped, protective force, consisting of the units of the Regular Army and the National Guard—a force capable of rapid expansion in time of a major emergency. In such an event, this force will be promptly augmented to the extent demanded by the military situation. This combined force is known as the Initial Protective Force. It will be reinforced by commissioned personnel from the Officers' Reserve Corps, by soldiers from the Regular Army Reserve, and by voluntary enlistments.

At the beginning of an emergency the mobile ground forces are aided by the operations of the Navy, by our mobile and fixed coast defenses, by the General Headquarters Air Force, and by the defenses of the Panama Canal, Puerto Rico, Hawaii, and Alaska, all of which serve as a protective barrier. In the continental United States, the mobile defense forces, organized and trained as divisions and corps, would be ready to move to any threatened part of our coast. In addition, it will also protect the land bases of the Navy and of our Air Corps.

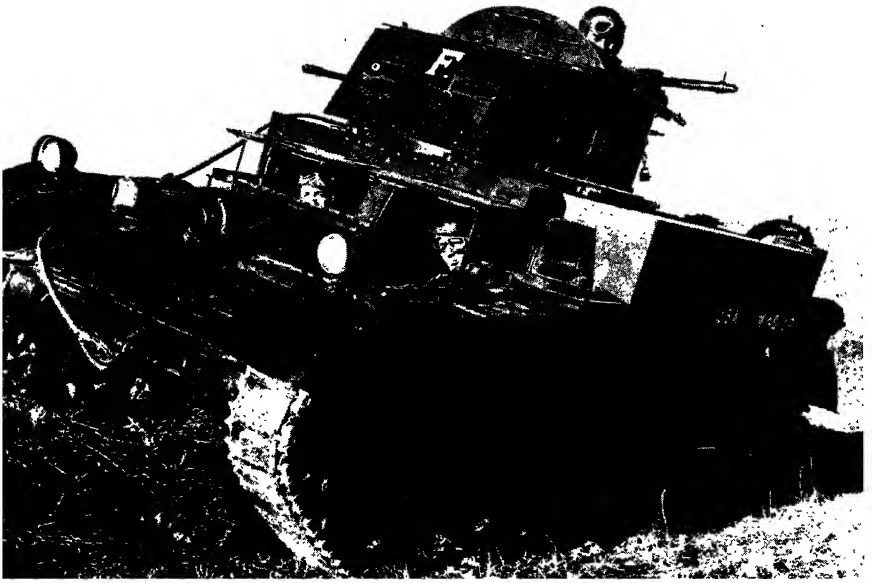
This force, including troops stationed in overseas garrisons, would act in cooperation with the Navy in defending the nation against any hostile attack until it is possible to bring into the Army, equip, and train the additional units needed for a balanced force of approximately a million men.

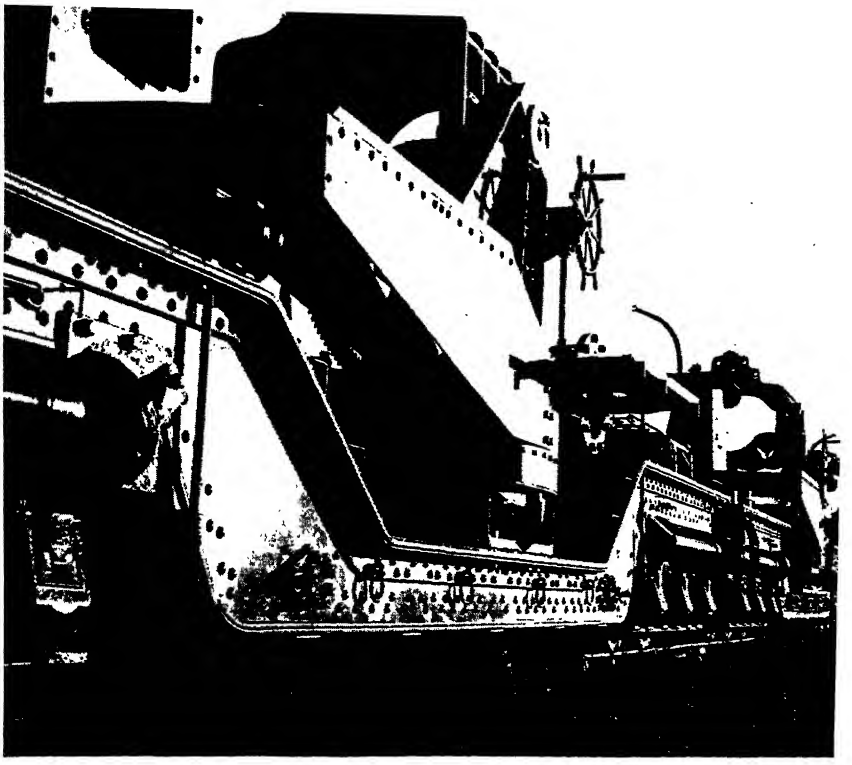
A balanced Army of this size is considered adequate for the initial protection of our country against invasion. If the emergency cannot be met by such a force, plans are completed for increasing the force to the size necessary.

The success of this entire plan is predicated, however, on the assumption that the equipment for at least the Initial Protective Force, and preferably for the balanced forces provided for in the remainder of the Protective Mobilization Plan, is immediately available. The time lag between the awarding of contracts and the actual delivery of critical necessities—weapons which cannot be procured from commercial firms—amounts to a period of from one to two years. The Army is now obtaining a large portion of the critical items of equipment it needs for the Initial Protective Force, as a result of legislative action by the Seventy-sixth Congress. The items which are now becoming available through these recent appropriations are steadily flowing into the hands of the units of the Regular Army and the National Guard. Many units, in fact, have already received part of this modern equipment.

When the delivery of equipment on order has been completed, many units mobilized in the Protective Mobilization Plan can be made ready for use in a theater of operations with a minimum loss of time. If all needed equipment were immediately available, the major problems of mobilization would be reduced to procuring additional men and mobilizing them into units, and training the units to the state of proficiency needed in order to enable them to take active part in actual combat operations.

Cavalry combat car crew practising mechanized tactics.





Coast Artillery railway mount at Aberdeen Proving Ground, Md.

The Industrial Mobilization Plan

Plans for the national defense must cover not only the mobilization of the Nation's manpower but also the mobilization of its industry in support of the combat forces. On M-day, industry must begin to produce arms, ammunition, and supplies for a force greatly in excess of the peacetime Military Establishment.

The War and the Navy Departments formulate procurement plans to meet this situation. The Industrial Mobilization Plan, evolved from years of study by the Army and the Navy with the cooperation of industry, develops an orderly method of obtaining the economic support of the Nation for the procurement plans of the two services. This plan takes into consideration what the wartime requirements of the armed forces and other agencies of the Government will be, what the essential needs of the civil population will be, and how industry can best meet these war requirements. The plan insures an efficient use of raw materials, labor, manu-

37-mm. Coast Artillery antiaircraft gun.

facturing facilities, management, power, finances, and transportation in a possible future war, and contemplates an equitable distribution of the economic burdens of war throughout the industries of the Nation.

In case of war, the arsenals of the Army will only be able to supply about 10 percent of the munitions that will be needed. The other 90 percent must come from civilian production. The War Department works continually in time of peace to secure the cooperation of industry in planning for national defense. It has surveyed 20,000 manufacturing plants to determine what war items these plants can best produce and in what quantities. As a result, 10,000 plants have been earmarked for war production. Their managers and proprietors have been informed of the emergency tasks to be imposed upon them, and they have all expressed their ability to meet those tasks.

Cavalry machine gunner removing gun from boot.

War production calls for the manufacture of many items for which there are few or no peacetime demands. Yet those supplies will be needed in large quantities in any major emergency and will be needed in the minimum of time. The success of our forces of defense may indeed depend upon receiving necessary munitions and other supplies without delay.

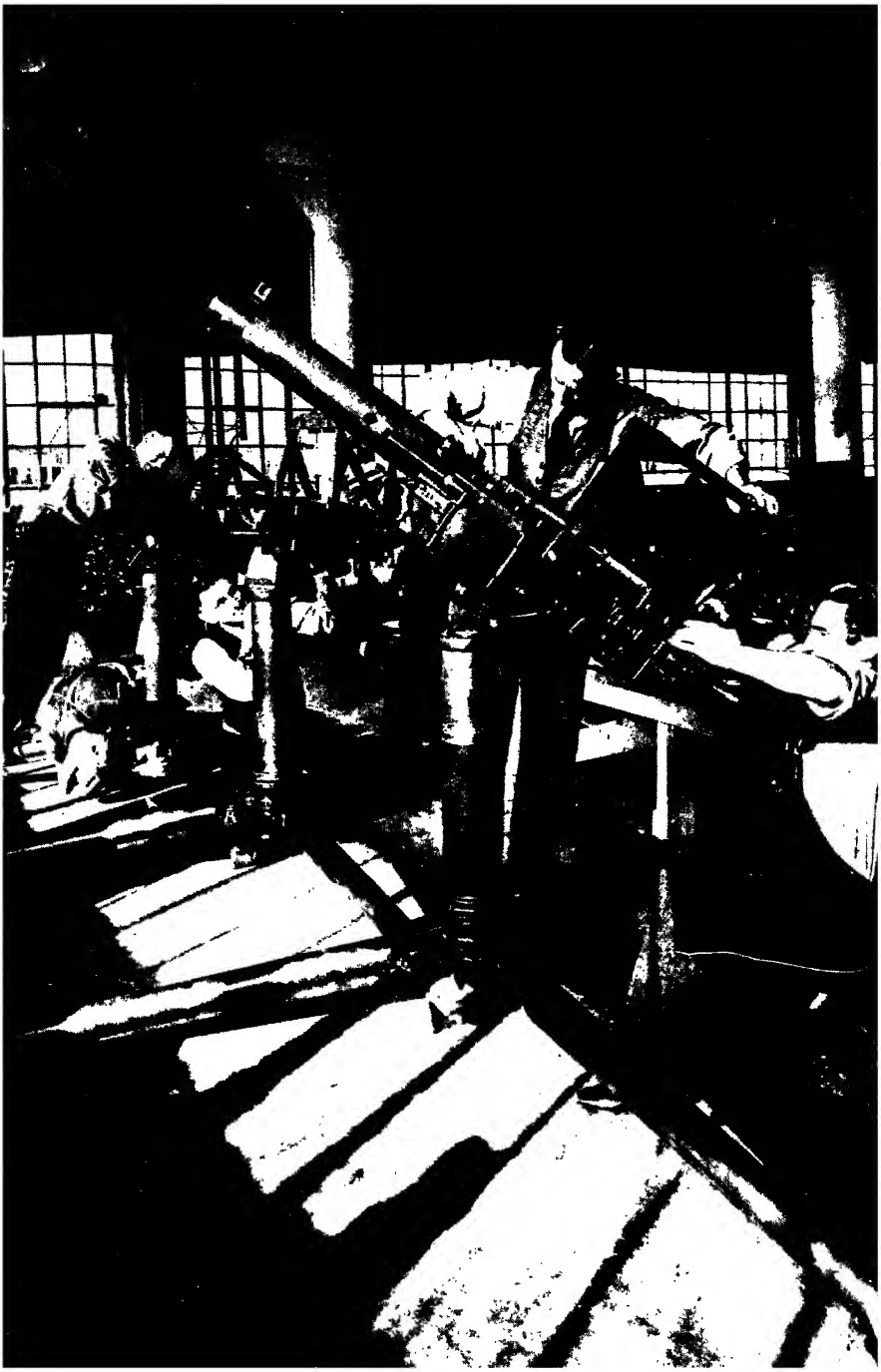
As one method of meeting this situation, Congress has from time to time appropriated funds for the awarding of "educational" orders to selected manufacturing plants. These are orders for limited amounts of noncommercial products placed with specific companies by the War Department to enable these companies to acquire skill and experience in making the products scheduled to them in the event of war. The supplies and materials so ordered are needed by the Army in its peacetime preparation for a possible war, but in war would be needed in much larger quantities.

To coordinate the war procurement problems involving Army and Navy interests and prepare the Industrial Mobilization Plan, the Army and Navy Munitions Board has been established, consisting of the Assistant Secretary of War and the Assistant Secretary of the Navy assisted by committees which are composed of officers on duty in the War and Navy Departments. This board forms and keeps up to date the plans and policies which in the opinion of the two departments should be adopted by the Government for coordinating and controlling procurement in a national emergency; coordinates Army and Navy procurement plans; and studies and makes recommendations on changes in procurement plans. In the event of war, this board would guide industrial activity until the full Industrial Mobilization Plan went into effect under civilian control.

The industry of the Nation, after conversion to wartime production, has the capacity to carry the full load that a major war would impose. Through the Industrial Mobilization Plan and procurement plans, these industries will be able to support the combat forces of the Army of the United States in the most efficient manner, with the least practicable delay, and with the minimum of disturbance to the national economy.

It must not be concluded, however, that the industrial mobilization plans by themselves insure adequate supplies to our Army on the outbreak of a possible war. The best efforts of our industries at this time will not provide adequate production in many of the important and complicated weapons of war until a year or more after M-day. A true preparedness in war supplies therefore requires that stocks of vital war materials be maintained at all times for immediate use in an emergency until the time when industry can provide them. Actual stocks as well as plans for industry are thus essential to meet the anticipated early needs of war.

Inspecting caliber .50 antiaircraft machine gun in Ordnance Department shops.



Infantry machine gun under camouflage.

The Regular Army

The Regular Army is the professional component of the Army of the United States. The principal duties of the Regular Army are to garrison our outlying posts, a responsibility which requires a permanent establishment; to provide the permanent overhead for the whole of the Army of the United States; to maintain a military educational system for its own personnel and for the personnel of other components of our defense forces; to furnish instructors for the National Guard and the Organized Reserves; to conduct civilian training activities, such as the Reserve Officers' Training Corps; and to be at all times available for immediate employment in the field. The place of the Regular Army in our Protective Mobilization Plan was explained in the preceding section of this chapter.

The strength of the Regular Army on June 30, 1939, including the Philippine Scouts, was as follows:

	Officers	*Enlisted men*
In the United States	10,055	127,203
In overseas garrisons	1,919	45,128
Special status (such as en route to or return from foreign service)	1,058	1,748
Total	13,032	174,079
Grand total		187,111

The strength of the Regular Army, by arms and services, was, on June 30, 1939, as shown in the next table, which, in addition to actual troops, shows the Army Nurse Corps, Cadets U. S. Military Academy, retired and Reserve officers on active duty, contract surgeons, and warrant officers.

Strength of the Regular Army by Arms and Services on June 30, 1939

Arm or service	*Officers*	*Enlisted men*	*Others*
General officers	65	.....	.....
Infantry	3,613	57,347	.....
Cavalry	914	9,862	.....
Field Artillery	1,662	22,638	.....
Coast Artillery Corps	1,068	18,921	.....
Air Corps	1,670	20,838	.....
Corps of Engineers	782	5,481	.....
Signal Corps	288	3,687	.....
Adjutant General's Department	89	.....	.....
Judge Advocate General's Department	89	.....	.....
Quartermaster Corps	608	10,437	.....
Finance Department	119	478	.....
Ordnance Department	286	2,729	.....
Chemical Warfare Service	98	803	.....
Medical Department	1,509	9,052	.....
Chaplains	124	.....	.....
Detached Enlisted Men's List	.....	5,439	.....
Professors, U. S. Military Academy	9	.....	.....
Warrant Officers*	.....	.....	775
Cadets, U. S. Military Academy*			1,274
Army Nurse Corps*	.....	.....	672
Total, less Philippine Scouts	12,993	167,712	2,721
Grand total, less Philippine Scouts, 183,426.			

*Not included in the preceding table.

Field radio in operation.

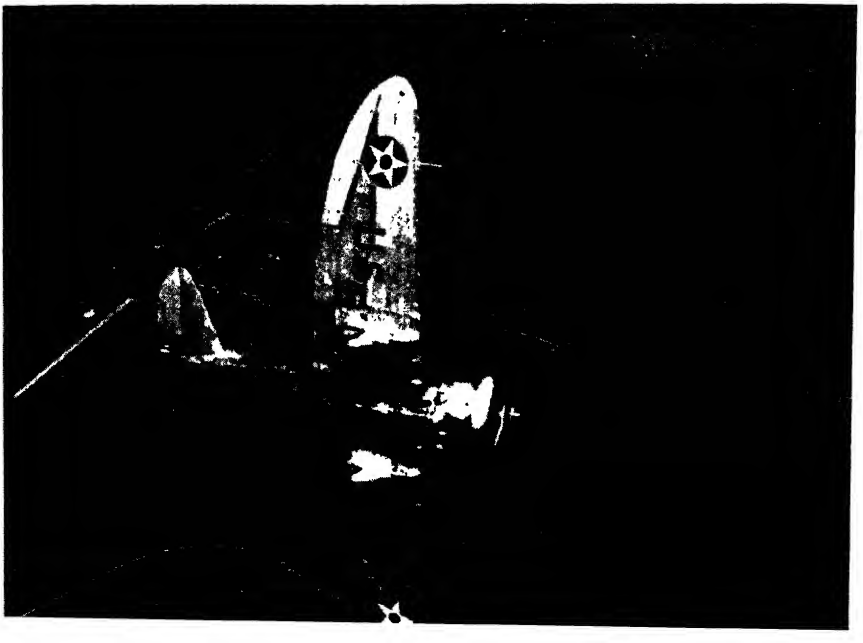
Strength of the Regular Army by Arms and Services on June 30, 1939—Con.

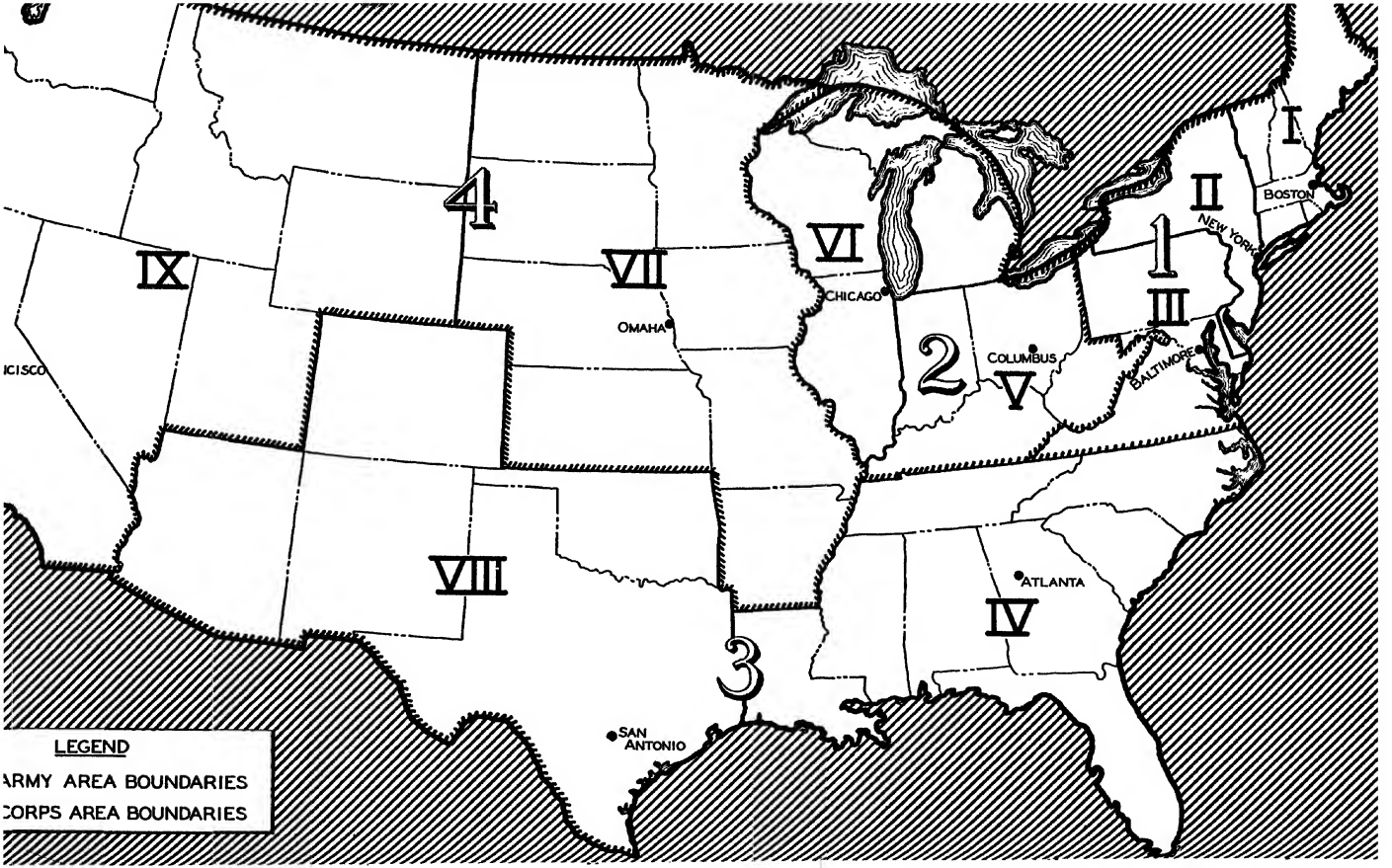
Army or service	*Officers*	*Enlisted men*	*Others*
Philippine Scouts:			
Infantry	11	2, 325	.....
Cavalry	2	559	.....
Field Artillery	5	979	.....
Coast Artillery Corps	8	1, 266	.....
Corps of Engineers	4	321	.....
Signal Corps	1	124	.....
Quartermaster Corps	8	433	.....
Finance Department	.....	6	.....
Ordnance Department	.....	47	.....
Medical Department	.....	307	.....
Total Philippine Scouts	39	6, 367	.....
Grand total, Philippine Scouts, 6,406.			
Total, Regular Army	13, 032	174, 079	2, 721
Grand total, Regular Army, 189,832.			
Others on active duty:			
Retired officers on active duty*	7	.....	.....
Reserve officers on active duty*	889	.....	.....
Contract surgeons*	.....	.....	31
Total	896	.....	31
Grand total, others on active duty, 927.			
Grand total on active duty, 190,759.			

*Not included in the preceding table.

Masked machine gunners advancing through smoke screen.

Pursuit plane in wing-over (Seversky *P–35*).

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IX
VII
VI
I
II
BOSTON
NEW YORK
1
III
CHICAGO
OMAHA
2
COLUMBUS
V
BALTIMORE
VIII
ATLANTA
IV
3
SAN ANTONIO
LEGEND
ARMY AREA BOUNDARIES
CORPS AREA BOUNDARIES

For strategical military purposes the United States is divided into four Army areas, and for military administrative purposes into nine corps areas:

First Army

First Corps Area
Headquarters at Boston, Mass.
Maine
New Hampshire
Vermont
Massachusetts
Rhode Island
Connecticut

Second Corps Area
Headquarters at Governors Island, N. Y.
New Jersey
Delaware
New York

Third Corps Area
Headquarters at Baltimore, Md.
Pennsylvania
Maryland
Virginia
District of Columbia

Second Army

Fifth Corps Area
Headquarters at Fort Hayes, Columbus, Ohio
Ohio
West Virginia
Indiana
Kentucky

Sixth Corps Area
Headquarters at Chicago, Ill.
Illinois
Michigan
Wisconsin

Third Army

Fourth Corps Area
Headquarters at Atlanta, Ga.
North Carolina
South Carolina
Georgia
Florida
Alabama
Tennessee
Mississippi
Louisiana

Eighth Corps Area
Headquarters at Fort Sam Houston, San Antonio, Tex.
Texas
Oklahoma
Colorado
New Mexico
Arizona (in part)

Fourth Army

Seventh Corps Area
Headquarters at Omaha, Nebr.
Missouri
Kansas
Arkansas
Iowa
Nebraska
Minnesota
North Dakota
South Dakota

Ninth Corps Area
Headquarters at Presidio of San Francisco, Calif.
Washington
Oregon
Idaho
Montana
Wyoming
Utah
Nevada
Arizona (in part)
California
Alaska (attached)

South. All were scheduled to return to their normal home stations upon completion of the extensive maneuvers.

Each year, also, there is a maneuver held in each corps area for the Regular Army troops within the area, and various unit maneuvers form a part of the scheduled training throughout the Army. The General Headquarters Air Force maneuvers are among the most extensive of these exercises.

The Regular Army Reserve

The Seventy-fifth Congress authorized the establishment of the Regular Army Reserve. This Reserve is formed through voluntary enrollment of enlisted men who finish an enlistment and return to civil life. These men, who desire that their country have the advantage of their training in an emergency, obligate themselves to return at once to active service in the event of war. They receive $2 a month, payable quarterly, for assuming this obligation and keeping in touch with the Regular Army units to which they are assigned. There is also a cash allowance of $3 per month for each month they have been members of the Reserve, with a maximum of $150. This allowance is paid if and when they are called back to active duty. Enlistment in this Reserve began on July 1, 1938, and is for 4 years. The strength of the Regular Army Reserve expected by the end of several years is 75,000.

★ ★ ★

The Army expansion legislation passed by Congress early in 1939, authorized an eventual increase of the Regular Army to approximately 16,500 officers and 210,000 enlisted men. The greater part of this increase of 4,000 officers and 37,000 enlisted men was made in the Air Corps, which by the same legislation was embarked on a program to increase its total number of airplanes from about 2,400 to 5,500. The Coast Artillery Corps manning the gun defenses of the Panama Canal was also substantially increased. It is planned to complete these increases by the end of 1940, except that the growth in number of officers will cover a period of 10 years. Until then, however, Reserve officers of the Air Corps will be placed on active duty in numbers sufficient to operate the new airplanes.

By the executive order of September 8, 1939, the Regular Army was further increased by 17,000 to a total strength of approximately 227,000.

Early in 1940, an air defense command was created with headquarters at the Northeast Air Base, Westover Field, Mass. This command includes coordination and control over antiaircraft units, pursuit airplane squadrons, and an aircraft warning service of signal communications, all of which are elements for the protection of an area against hostile air attack.

Mississippi National Guardsmen on motor march.

The National Guard

The National Guard, by the executive order of September 8, 1939, was increased to an authorized strength of approximately 15,000 officers and 235,000 enlisted men. It is made up of citizens of the United States who are so interested in national defense that they desire to take an active part in military affairs in addition to managing their own private ones.

There are National Guard units in every one of the 48 States, in Hawaii and Puerto Rico, and in the District of Columbia, and units are now in process of organization in Alaska. These units are distributed in 1,500 different stations. Like the Regular forces, the National Guard contains units of all the different arms and services that go to form a modern army.

There is a long tradition behind the National Guard. Even before the Colonies became States, some of them had their own active units of organized volunteers. In all of our wars, the States have given many such units to our fighting armies. Indeed, their part in every war in the history of the United States has been of highest importance.

The National Guard has not always been a part of our national forces.

Switchboard at command post of National Guard infantry regiment.

Originally it was composed of troops separately formed and trained by each State, and entirely under State control. It came under the Federal control only in times of emergency. Each State trained and equipped its regiments in its own way. Even the uniforms were different.

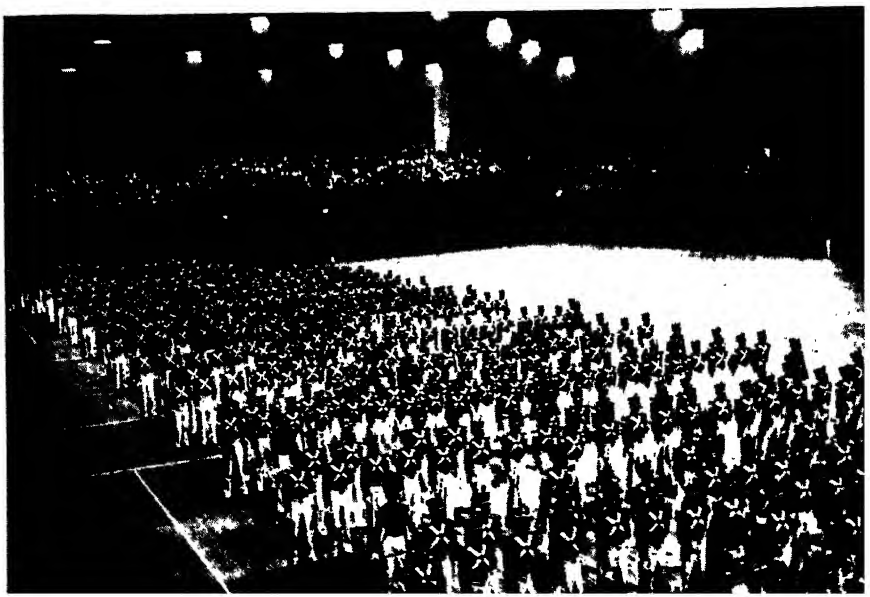
In 1903, however, the National Guard came, by act of Congress, much closer in touch with our National Government and our Regular forces. Since that law was passed, the National Guard has had the same kind of service uniform and equipment as the Regular Army and has followed the same methods of training. The law of 1903 also gave authority for the National Guard to have officers of the Regular Army as instructors, and for the Guard to join with Regular Army units at camps for field training.

Later acts of Congress, especially the National Defense Act of 1920 and the National Guard Status Bill of 1933, have made the National Guard one of the three main components of our armed land forces. These laws have established what is known as the National Guard of the United States as distinguished from the National Guard. Officers of the National Guard who meet certain standards of age, physical condition, and professional

ability generally similar to those required in the Regular Army, are then "federally recognized" and appointed as officers in the National Guard of the United States which makes them officers in the Army of the United States. Practically all officers of the National Guard are so appointed. To the extent provided for from time to time by appropriations for this specific purpose, the President may order officers of the National Guard of the United States to active duty in an emergency at any time and for the period of the emergency, subject to the qualification that, except in time of emergency expressly declared by Congress, no officer of the National Guard of the United States shall be employed on active duty for more than fifteen days in any one calendar year without his own consent. The Governor of a State, of course, can order the National Guard of his State to active duty for training and other purposes in accordance with the laws of that State. All members of the National Guard take an oath to bear true allegiance to the United States and to their own State, and to obey the orders of the President of the United States and the Governor of their own State. In consequence of this obligation, they are not only liable to Federal call or order in a national emergency, but to call within their own States in times of local disaster or danger.

During the World War, National Guard units of the various States and Territories contributed almost half a million men to the Army. Two out of every five divisions that went to France were National Guard units, and by far the greater part of these saw service on the field of battle. If it again becomes necessary for our Army to take the field, in any major

7th Regiment, New York National Guard, in full dress ceremony.



emergency of national defense, the National Guard would, as in the World War, furnish hundreds of thousands of men.

The National Guard receives money by annual appropriation from Congress for many of its needs. These funds provide arms and other equipment, uniforms, motor vehicles, horses, and airplanes, provide for the construction and repair of certain buildings at camps, and for sending officers to the service schools of the Regular Army for courses of training, and for many other needs. It receives money from the States for the building and upkeep of armories and camps, for extra field training pay and extra pay in times of State emergency, and for numerous other expenses.

The National Guard is organized into divisions, brigades, regiments, and other units like the Regular Army. The units in each corps area come under the supervision of the corps area commander in time of peace, and automatically become part of his command when they are first ordered into the active military service of the United States in case of national emergency.

The National Guard infantry divisions, and the States and corps areas in which they are located, are as follows:

Corps Area	*Division*	*States*
I.....	26th Division.....	Massachusetts.
I.....	43rd Division.....	Connecticut, Maine, Rhode Island, Vermont.
II.....	27th Division.....	New York.
II.....	44th Division.....	New Jersey, New York.
III.....	28th Division.....	Pennsylvania.
III.....	29th Division.....	Maryland, Virginia, District of Columbia, Pennsylvania.
IV.....	30th Division.....	Georgia, North Carolina, South Carolina, Tennessee.
IV.....	31st Division.....	Alabama, Florida, Louisiana, Mississippi.
V.....	37th Division.....	Ohio.
V.....	38th Division.....	Indiana, Kentucky, West Virginia.
VI.....	32nd Division.....	Michigan, Wisconsin.
VI.....	33rd Division.....	Illinois.
VII.....	34th Division.....	Iowa, Minnesota, North Dakota, South Dakota.
VII.....	35th Division.....	Kansas, Missouri, Nebraska.
VIII.....	36th Division.....	Texas.
VIII.....	45th Division.....	Arizona, Colorado, New Mexico, Oklahoma.
IX.....	40th Division.....	California, Nevada, Utah.
IX.....	41st Division.....	Idaho, Montana, Oregon, Washington, Wyoming.

The National Guard cavalry divisions are distributed in the States and corps areas as follows:

Cavalry machine gun unit of National Guard fording stream.

Corps Area	*Division*	*States*
II, III.....	21st Cavalry Division....	New York, Pennsylvania, Massachusetts, Connecticut.
V, VI.....	22nd Cavalry Division...	Pennsylvania, Ohio, Kentucky.
IV, VIII.....	23rd Cavalry Division...	Alabama, Georgia, Louisiana, Tennessee, Illinois, Michigan, Wisconsin.
VII, VIII, IX...	24th Cavalry Division...	Colorado, Idaho, Iowa, Kansas, Washington, Wyoming.

There are many other National Guard units, which are not a part of numbered divisions, located in most of the States shown in the above table, in New Hampshire, Delaware, and Arkansas, and in Puerto Rico and Hawaii.

Units of the National Guard, like those of the Regular Army and the Organized Reserves, are designated by numbers. Regiments have, in general, numbers between 100 and 300, and infantry divisions have numbers between 26 and 75. The State to which a National Guard unit belongs is always given in addition to the number. Some units with old traditions received authority under the National Defense Act to keep their old numbers, for example, "The First Infantry (Maryland National Guard)". Others may use their old names in addition to their new numbers, for example, the Washington Artillery, which is the One Hundred and Forty-first Field Artillery (Louisiana National Guard).

75-mm. gun camouflaged (National Guard, Field Artillery).

At their home stations the units of the National Guard assemble at least one night a week for active training. They meet in armories provided by their States not only as drill halls but as places where arms and equipment can be safely kept. Often, too, there are meetings of a social kind, for there is relaxation within the brotherhood of arms, as well as hard work.

In the summer the National Guard goes to camps for field training. These may be purely State camps composed entirely of National Guard troops, or Guard units may join with parts of the Regular Army in large maneuvers. This summer training usually lasts for two weeks. An important part of it is the actual travel from home station to camp by marching, by motors, or by train, which gives practice in troop movement for field service. Similar field training may be held at other times of the year.

Officers of the Guard also prepare themselves for their part in national defense by attending military schools. Selected officers go each year to the service schools of the Regular Army. Many others attend officers' schools in their own units, or study the correspondence lessons of the Army Extension Courses, or otherwise improve their military knowledge.

Members of the National Guard who find themselves unable to continue their active military training owing to pressure of business or other personal reasons may be transferred to the Inactive National Guard, and thus keep their contact with the Army. Members of the Inactive National Guard retain their grades and may be called to active duty in case of war to fill vacancies in National Guard units. Members of the Inactive National Guard may attend training with active National Guard units under regulations prescribed by the Chief of the National Guard Bureau. No transfer is permitted from the Inactive National Guard to an active status except in case of war. Above the grade of first lieutenant the number of inactive members is limited to the number required to bring the officer personnel of the Guard to war strength.

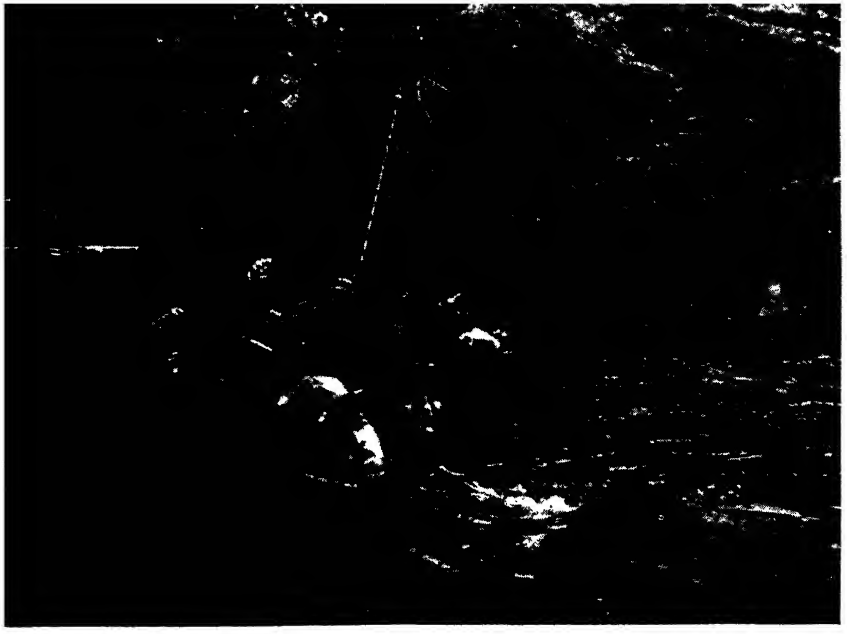
The strength of the National Guard on June 30, 1939, by arm and service, was as shown in the following table:

Strength of the National Guard, June 30, 1939

	Officers	*Warrant officers*	*Enlisted men*	*Total*
Major generals of the line	17	.....	.....	17
Brigadier generals of the line	63	.....	.....	63
Adjutant General's Department	137	.....	.....	137
Air Corps	468	.....	1,848	2,316
Cavalry	798	19	10,919	11,736
Chaplains	234	.....	.....	234
Chemical Warfare Service	22	.....	.....	22
Coast Artillery Corps	926	20	13,774	14,220
Corps of Engineers	495	17	8,205	8,717
Field Artillery	3,195	57	36,715	39,967
Finance Department	47	.....	.....	47
Infantry	5,515	83	91,980	97,578
Judge Advocate General's Department	97	.....	.....	97
Medical Department	1,537	15	12,211	13,763
Ordnance Department	86	.....	507	593
Quartermaster Corps	673	.....	5,191	5,864
Signal Corps	145	.....	1,908	2,053
Total	14,455	211	183,258	197,924
Inactive National Guard	674	.....	20,306	20,980

The National Guard Bureau

Since the National Guard, in time of peace, is spread throughout the 48 States, Puerto Rico, Hawaii, and the District of Columbia, it is necessary to have some central agency to supervise its work. The National



Cavalry machine-gunners fording stream.

Guard Bureau in Washington exists for this purpose. It is the part of the War Department through which the Secretary of War keeps in constant touch with the whole National Guard. The Chief of the National Guard Bureau is an officer of the National Guard appointed by the President to active duty for 4 years with the rank of major general. As his assistants he has 30 officers of various arms and services from the Regular Army and the National Guard.

The National Guard Bureau keeps records dealing with the National Guard in time of peace. It estimates the amount of money needed each year for Guard expenses. It recommends to the Secretary of War how the total of National Guard appropriations should be divided among the States and Territories, and the District of Columbia. It also explains the policies and plans of the War Department to the National Guard; and it prepares regulations and makes suggestions of many kinds looking toward National Guard improvement and development.

The Organized Reserves

The Organized Reserves form one of the major components of the Army of the United States. They consist of units allocated locally for wartime mobilization, which in a national emergency will be filled with personnel

Cavalrymen and mounts going through gas.

of the Army of the United States from various sources. In time of peace, personnel of the Regular Army, the Officers' Reserve Corps, and the Enlisted Reserve Corps are given assignments to units of the Organized Reserves.

The Officers' Reserve Corps consists of citizens of the United States who receive military training through military correspondence courses, periodic attendance at meetings conducted for their instruction, and occasional periods of active duty at military camps or maneuvers, and who are prepared through such training to take up their military duties in the Army of the United States in the event of a national emergency. The Officers' Reserve Corps is the largest body of potential wartime officers in the military forces of the country. In time of peace, its members hold commissions in the various arms and services of the Army of the United States as Reserve officers. They may be called to active duty in peace or war, but in time of peace may be called upon to perform "extended" active duty (for more than 2 weeks) only with their own consent. The Officers' Reserve Corps still contained, on June 30, 1939, about 14,000 members who had seen service in the World War. The great majority, however, of those who are

Clouds of Chemical Warfare smoke.

now Reserve officers have come from among the graduates of the Reserve Officers' Training Corps and Citizens' Military Training Camps in the period since the World War, and from men of special knowledge commissioned to give the Army the advantage of their abilities in war. A small number of citizens are enrolled as members of the Enlisted Reserve Corps.

The Officers' Reserve Corps is the source from which about 4,500 Government employees are drawn for the Civilian Conservation Corps as commanders and assistant commanders at CCC camps, and assistants to officers of the Regular Army in the administration of the CCC at district and higher headquarters. Certain second lieutenants of the Officers' Reserve Corps are selected to compete for commissions in the Regular Army through a year of active training and competitive examinations under the Thomason Act. Other Reserve lieutenants come into the Regular Army by qualifying for Air Corps and Medical Department commissions.

About two-thirds of the Officers' Reserve Corps are assigned to regiments and to other Reserve units distributed throughout the United States. Others, mainly officers of junior rank, are assigned to Regular Army units. Still others have special assignments in line with their special capacities in civil life so that the most can be made of these abilities in war. Many of these officers are assigned to recruiting, supply, and training duties, and

National Guard and Reserve Corps officers observing artillery fire.

to other agencies which must become effective at once in raising and maintaining our wartime Army, and therefore constitute a first priority for mobilization. On June 30, 1939, the total number of Reserve officers eligible for assignment, active duty, and promotion was 104,575. Of these, about 65 percent were assigned to units of the Organized Reserves and about 25 percent to units of the Regular Army.

The Officers' Reserve Corps has for its main purpose the provision of officers for the Army of the United States as it rapidly expands upon the outbreak of war. It forms a large and immediately available source of officers trained for this purpose. In any major war the Army will require many more officers than it will have available in its several components. Therefore, large numbers of additional officers would have to be trained after war began. These will be selected for training from the ranks of the wartime Army and from civil life, and will be commissioned on the basis of proved ability to qualify for wartime command. In the meantime, however, the members of the Officers' Reserve Corps will become commanders and staff officers in the units first enlarged to war strength in all components.

Thus the immediate need for trained officers is likely to be so pressing in any major war that the services of Reserve officers, assigned in time of peace to certain units of the Organized Reserves, may be required at once

for active duty with other units, of the Regular Army, the National Guard, or the Organized Reserves. So far as practicable these officers will be released from their initial duties in time to join their original units for mobilization.

During years of peace, the members of the Officers' Reserve Corps receive training through local instruction assemblies held regularly under Regular Army officers who are assigned as instructors to their units. They also attend 14-day periods of active-duty training in special camps, or spend active-duty periods with the C. M. T. C. and units of the Regular Army and National Guard. Selected Reserve officers also attend courses of 3 months' duration as students at Army service schools. A few officers of the Reserve Corps are at all times on extended tours of duty as members of the War Department General Staff. Under the Thomason Act several hundred Reserve second lieutenants receive a year's training with units of the Regular Army each year. Several hundred other Reserve lieutenants of the Air Corps are kept on active duty with Regular Army Air Corps units for periods up to 5 years during which time they receive continuous training.

The law permits the Government to call out Reserve officers for a 2-week training period once in any year. The policy of the War Department, however, is to call them for such duty only upon their own application, and with their own consent obtained in advance, and permits them to cancel their calls when unexpected personal or business affairs arise. In order to remain an active member of the Reserves, and become eligible for promotion, a Reserve officer must perform a certain amount of active-duty training and must also complete a certain number of hours of Army Extension

75-mm. howitzer pack artillery on skyline.

Course work and attend periodic meetings for instruction under Regular Army instructors.

During the year ended June 30, 1939, 30,705 Reserve officers had active duty training of 2 weeks or more. This figure does not include the officers who were on duty with the Civilian Conservation Corps.

The officer of the War Department charged with the supervision of matters concerning the Organized Reserves is the Executive for Reserve Affairs in the office of the Chief of Staff.

The Reserve components of the Army of the United States insure effective citizen participation in the national defense in accordance with the traditions of the United States of America in its national emergencies of the past.

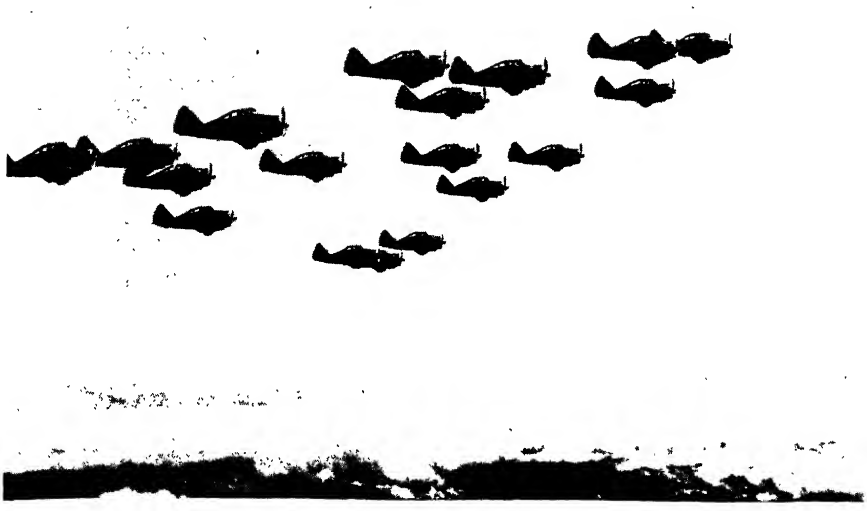
Summary

The three components of the Army of the United States—the Regular Army, the National Guard, and the Organized Reserves—form, in time of peace, an efficient framework capable of rapid expansion if a new war should come. On June 30, 1939, the active members of the three components were as follows:

	Commissioned officers	*Warrant officers*	*Enlisted men*	*Total*
Regular Army	13,032	775	174,079	187,886
National Guard	14,455	211	183,258	197,924
Organized Reserves	104,375	.....	3,054	107,629
Total	.....	.....	.....	493,439

All three components have an essential part in our system of national defense, and all three are thoroughly representative of our country and its traditions of liberty and democracy.

The increases in the Regular Army and the National Guard authorized up to the end of 1939 will bring this total strength up to approximately 585,000 before June 30, 1940.



Formation of Seversky *P–35* pursuit airplanes.

CHAPTER II

THE ARMS

THE arms—the fighting units—of our Army are: the Infantry, Cavalry, Field Artillery, Coast Artillery Corps, Air Corps, Corps of Engineers, and Signal Corps.

The Infantry is the principal combat arm, though the Cavalry also comes into direct personal contact with the enemy on the ground and the Air Corps with him in the air. The Cavalry and the Air Corps have also the task of going out ahead of the other elements of the Army to locate the enemy and gain first contact with his forces, and after that to watch closely what the hostile army does and where it moves. The Air Corps, in addition, flies long distances to bomb the supply centers and other rear installations of the enemy, thus to interfere with and delay his operations.

The guns and howitzers of Field Artillery add their strong supporting fires to the bullets and shells of Infantry and Cavalry to defeat an enemy in battle. The antiaircraft guns of Coast Artillery attack all enemy planes that come within sight and range, and the coast defense guns of this same

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Infantry machine gunners.

Infantrymen moving into position.

arm share with the Navy and with the Army Air Corps the vital task of protecting our shores from any possible attempts at a hostile landing.

The Engineers plan and help to build the field fortifications of part or

Field artillerymen laying 155-mm. gun.

all of the Army when it goes on the defensive, and help it to move readily from place to place by building and repairing roads and bridges. This arm has many other engineering duties such as making maps and construct-

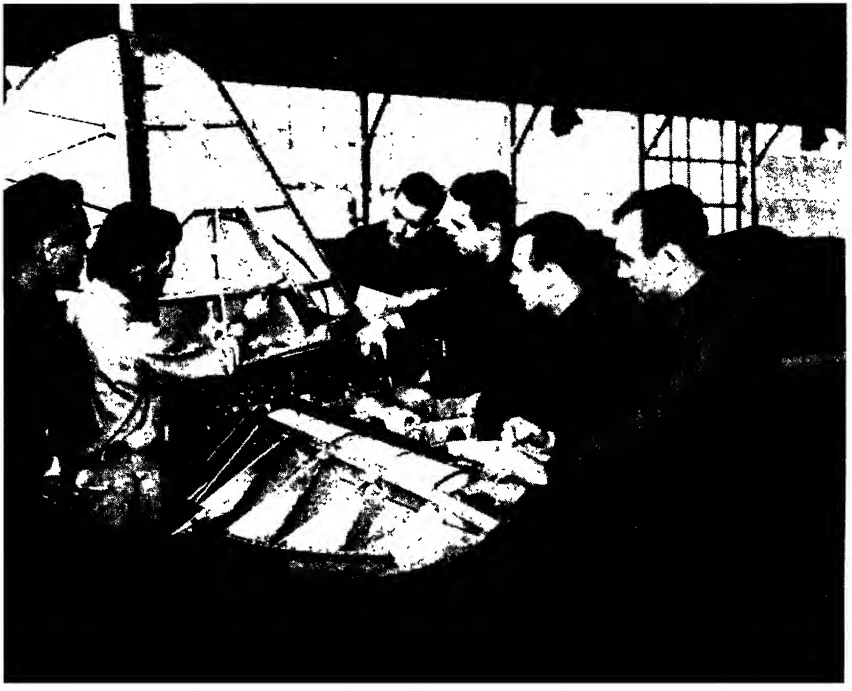
16-inch Coast Artillery harbor-defense gun firing.

ing buildings and railways. Since the Engineers must carry out much of their work near the front of battle, they too, like Infantry and Cavalry, may enter into direct combat with the enemy. The Signal Corps keeps the different units of the Army in constant touch, during battle and campaign, through radio, telegraph, telephone, messengers, and other communication means. Since the Signal Corps must perform its duties in the midst of battle, it is a combat arm.

Units of all arms (and services, too) are joined together for combat in large war units called divisions, corps, and field armies. But since each arm has many special interests mainly of concern to itself, each has had since 1920, a "chief of arm" with headquarters in Washington forming part of the War Department.

The chief of an arm is first of all an adviser to the Chief of Staff on important matters concerning the arm. He cooperates with other chiefs of arms and services in the many matters that go beyond his own arm. Although he does not command the troops of his arm, yet he controls and directs the special service school of his arm and its Board, usually at the same place as the school, which assists him in studying, deciding upon, and developing new or improved methods and equipment, weapons, and other supplies of war. This work, in the usual case, brings the chief of an

Coast Artillery 3-inch antiaircraft gun and crew.



Air Corps flying cadets studying airplane construction.

arm in close touch with the chiefs of other arms and of services charged with supplying the tools of war to his own arm. The Chiefs of the Air Corps, Engineers, and Signal Corps, supervise the supply of war materials to their own and other arms.

The chief of an arm and his assisting agencies prepare the manuals and other training publications which explain and regulate the employment, instruction, and training of his arm, and the care and use of the weapons and other materials of war with which they are equipped.

The chiefs of arms cooperate with and assist the Chief of the National Guard Bureau and the Executive for Reserve Affairs in all matters connected with the organization, instruction, training, equipment, and general administration and efficiency of their arms in the National Guard and the Organized Reserves.

The arms, assisted by the services, cooperate to the utmost in war to defeat the enemy, and in peace to prepare all components of the Army of the United States for an efficient and adequate defense of our country. At the same time, each arm has its own long-standing traditions. Among them is a fine rivalry in excellence at arms as well as a genuine spirit of close cooperation in all the modern activities of a major army.

Infantry tanks at night.

The Infantry

The Infantry is the main fighting part of an army. It fights on foot and in tanks. It can maneuver and fight, attack and defend, on all kinds of ground. In battle infantry usually has the main task. With the support of other arms, it moves against the enemy and overcomes him; it gains ground and holds it. If the enemy attacks in force the defensive firmness and fire-power of infantry is the final means of stopping him and driving him back again.

An infantry division is a large combat unit made up of a number of different arms and services, but the largest and the fundamental part of its fighting strength consists of infantry. The triangular (streamlined) infantry division contains three infantry regiments, two regiments of supporting field artillery, one battalion each of engineer, medical, and quartermaster troops, and a company of signal corps troops, with a total wartime strength of about 12,500, about 7,200 (57 percent) of which consists of infantry. The square division contains two infantry brigades, each of two regiments, a brigade of three regiments of supporting field artillery, one regiment each of engineer, quartermaster, and medical troops, and smaller units of ordnance and signal corps specialists, to make a total strength of about 18,500, about 10,600 (57 percent) of which consists of infantry. Cavalry, air corps, and chemical warfare units, and additional tanks, field artillery, and engineers, are often added temporarily. All of these operate to support the infantry fighting effort.

The organization of the infantry regiment was somewhat changed early

in 1939. The regiment, both in peace and war, now contains a total of 14 companies as follows: a regimental headquarters company, a service company, and three battalions, each containing three rifle companies and a heavy-weapons company. Rifle and heavy-weapons companies are designated by letters within each regiment, running from A to M, except that J is left out. The fourth company in each battalion (Companies D, H, and M) is the heavy-weapons company, and contains caliber .30 machine guns, caliber .50 machine guns, and 81-mm. mortars.

The war strength of infantry units from companies to divisions follows:

Unit	*Officers*	*Enlisted men*	*Total*
Rifle company	6	162	168
Heavy-weapons company	6	143	149
Battalion	27	672	699
Regiment	115	2, 426	2, 541
Brigade (approximate figures)	212	4, 727	[1] 4, 939
Triangular (streamlined) division	.....	.....	[2] 12, 500
Square division	.....	.....	[2] 18, 500

[1] The triangular (streamlined) division contains no brigades.
[2] This includes other supporting arms and services in the division.

The peace strength of infantry units is roughly two-thirds their war strength.

The chief weapons of infantry are the shoulder rifle with its bayonet, the tank, and the machine gun. Other infantry weapons, all of them important in warfare, are the hand grenade, the caliber .30 automatic rifle, the pistol, the caliber .50 and the 37-mm. (antitank) guns, and the 60- and 81-mm. mortars.

The combat clothing and equipment carried on the person of the infantry soldier consists of the field uniform (steel helmet, shirt, trousers, leggins, shoes, underclothing, and, according to the season, raincoat or coat and overcoat); haversack (carrying his mess kit); canteen and cup in a carrier and first-aid kit on his belt; pack containing blanket, shelter tent, poles, pins and toilet articles; gas mask; intrenching tool; and reserve ration. In addition, he carries a weapon and ammunition for it. The rifleman has the rifle, bayonet, 136 rounds of ammunition and a hand grenade. The automatic rifleman or light machine gunner has the automatic rifle or light machine gun and 180 rounds of ammunition packed in 9 magazines each carrying 20 rounds. The machine gunner, ammunition carrier,

Infantry soldier carrying automatic rifle.

communications man, and tanker, each carries a pistol and 21 rounds of ammunition.

The rifleman's load is approximately 64 pounds; the automatic rifleman's or light machine gunner's, 74 pounds. Those armed with pistols carry 45 pounds, but these men in addition often have to carry machine guns and other heavy loads for considerable distances. Winter clothing adds seven pounds more. It is often considered best for troops to drop their rolls containing blankets and extra clothing before they enter a battle. This cuts down the fighting load by 9 pounds.

Besides what a soldier carries himself, the combat train vehicles of the infantry regiment carry for him 1 day's ration of food and water, and about the same amount of ammunition that he carries into battle himself. Another day's supply of rations and ammunition is carried for each infantry regiment in trains of the infantry division. In other parts of this book are described the various supporting troops and helpful services that form part of an infantry division and support the infantry soldier as he fights, and carry reserve supplies of food and ammunition for him.

The following table gives the characteristics of all infantry weapons except the bayonet and the tank. Tank units and tanks are described later on:

Characteristics of Infantry Weapons

Weapon	*Caliber*	*Maximum range*	*Weight*	*Rate of fire*	*Weight of ammunition (per unit)*
	Inches	*Yards*	*Pounds*	*Rounds per minute*	
Rifle, M 1903	.30	5, 500	8. 4	7–10	1 ounce.
Rifle M1 (semiautomatic)	.30	5, 500	9. 4	15–30	1 ounce.
Automatic rifle	.30	5, 500	17. 1	150	1 ounce.
Machine gun	.30	5, 500	82. 0	525	1 ounce.
Antitank gun	.50	7, 500	128. 0	500	4 ounces.
37-mm. (antitank) gun	1. 4	7, 500	850. 0	30	4 pounds.
60-mm. mortar	2. 4	1, 300	51. 4	30–35	2.4 pounds.
81-mm. mortar	3. 2	3, 280	134. 0	30–35	7.2 and 15.8 pounds.
Pistol	.45	1, 600	2. 4	.....	1.5 ounces.
Hand grenade	.....	50	.....	.....	1.3 pounds.

Through constant experiment with new and improved weapons and other tools of war, the Infantry of our Army steadily changes its methods and its make-up in order to keep at the highest state of efficiency for our national defense. An important recent improvement is the development of powerful but light guns to use against an enemy's tanks. These antitank

Caliber .50 antitank gun under camouflage net.

guns, of which there will be many in each infantry regiment and division, are used to protect troops of the whole division from an enemy tank attack coming from any direction.

The Infantry is now being equipped with fast modern tanks, which carry substantial armor and machine guns. They can move about 35 miles an hour on roads and rapidly across fields, and can go at a good rate over rough ground.

Tanks are organized into separate infantry units of their own. War-strength infantry tank units have the following numbers:

Unit	*Number of tanks*	*Number of officers*	*Number of enlisted men*	*Total number of troops*
Company	17	6	123	129
Battalion	54	31	522	553
Regiment	162	121	1,870	1,991

In our peace-time Regular Army, there are 8 tank companies and 11 other companies in partly organized regiments. All of them are in the United States except one company on foreign service.

The Infantry of our Army is its largest arm both in peace and in war. The Army of the United States on June 30, 1939, contained the following numbers of infantry in each of its three components:

Component	*Regiments*	*Officers*	*Enlisted men*
Regular Army	39	3,613	57,347
National Guard	83	5,515	91,980
Organized Reserves	124	36,437	1,649

The infantry units of the National Guard have 976 different home stations distributed in nearly every State of the Union, 10 stations in Hawaii and 13 stations in Puerto Rico—999 stations in all. The Infantry of the Organized Reserves is likewise spread throughout the United States and its overseas possessions in 124 different regiments.

In time of a national emergency that requires the Army of the United States to take the field, the Infantry, like all parts of the Army and Navy, will begin to expand at once. Among the units to be mobilized immediately will be 23 infantry divisions, 5 from the Regular Army and 18 from the National Guard.

Infantry in engineer assault boats.

Cavalrymen with Thompson submachine guns at inspection.

The Cavalry

The Cavalry is a fast-moving fighting arm. It is divided into two kinds—horse cavalry, and mechanized cavalry which moves and fights in armored cars and in combat cars that are much like tanks. Horse cavalry, when it comes in contact with the enemy, usually dismounts and fights on foot like infantry. Cavalry on horse charges at the enemy when it surprises small groups of his forces.

The Cavalry has many tasks in war. Not only does it join the other fighting arms in direct attacks upon the enemy; it also precedes the main army, exploring the ground ahead of it, driving back the enemy's cavalry or other advance troops, and reconnoitering to find the enemy's main forces. Because of its ability to move far and fast, the Cavalry may also be used by the main commander to circle around the enemy's forces and attack him from the rear, or to go to areas many miles from our own main army to find out how strongly the enemy holds these distant areas, and perhaps to prevent one part of the enemy's army from joining another. In its tasks of reconnaissance (exploration) the Cavalry usually works in close cooperation

Cavalry machine gunners.

with Air Corps reconnoitering units. The Cavalry is also used to pursue, block, and capture a defeated and retreating enemy force.

A cavalry division is a large combat unit made up of many different arms and services, the main part of whose fighting strength consists of cavalry. It contains no infantry, but has all of the other kinds of units mentioned in describing the infantry division on page 57. A cavalry division contains both horse and mechanized units, and all parts of it are equipped for rapid movement. For example, the field artillery of a cavalry horse division is drawn by six-horse teams in units in which all men are mounted. A cavalry division contains no men who march habitually on foot.

In a horse cavalry regiment of wartime there are 12 troops, as follows: a regimental headquarters and service troop, a machine-gun troop, a special-weapons troop, and nine rifle troops. The headquarters and service troop provides truck transportation and means of communication for the regiment and contains a scout-car platoon of armored motor vehicles with machine guns and radio. The machine guns of the machine-gun troop are carried on pack horses led by men mounted on other horses.

The weapons of the Cavalry include the pistol, rifle, caliber .30 air-cooled machine gun, caliber .30 water-cooled machine gun, caliber .45 sub-machine gun, caliber .50 machine gun, 37-mm gun, and 4.2-inch mortar. These weapons are much the same as the corresponding infantry weapons.

A sturdy type of horse, one-half or three-quarter bred, and a high standard

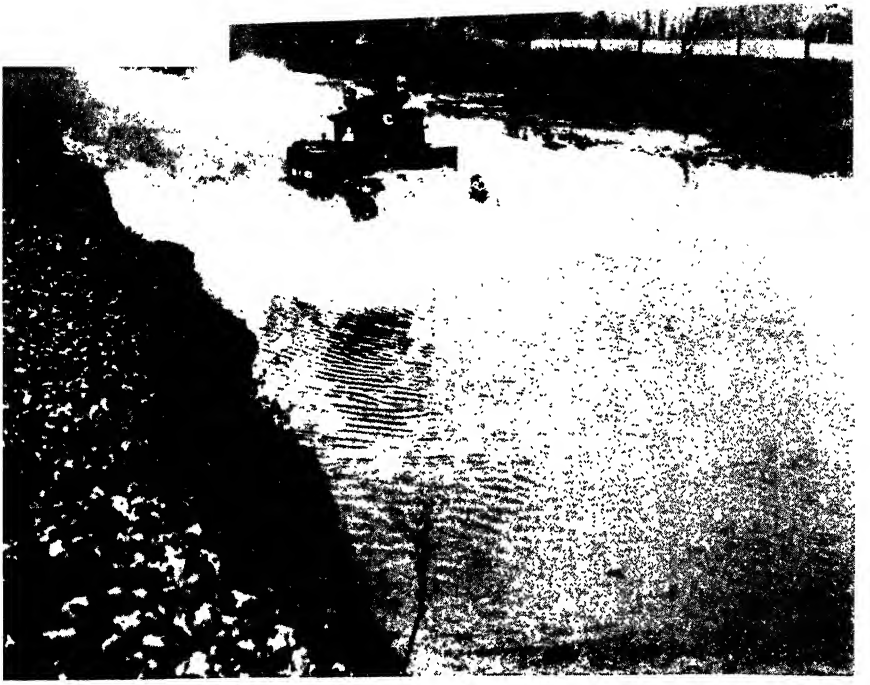
Horse cavalry passing in review.

of horsemanship among all rank, result in speedy movement and prolonged effort by horse cavalry in campaign. The use of pack horses to carry all supporting weapons of the horse-cavalry regiment is a unique American method.

A mechanized cavalry regiment consists of eight troops: headquarters troop, service troop, reconnaissance troop, machine-gun troop, and four combat-car troops. The headquarters troop operates the headquarters of the regiment. It also contains the 4.2-inch mortar platoon, which fires smoke shells as a defense against hostile antitank weapons. The service troop provides transportation and maintenance. The reconnaissance troop is used by the regimental commander for seeking information of the enemy. The four combat-car troops provide the striking power of mechanized cavalry with their combat cars, which are very similar to tanks and have machine guns for use against enemy soldiers and tanks, and against enemy aircraft. All cavalry combat vehicles are equipped with a machine gun or submachine gun for the defense of the crew.

All command cars are likewise armored and carry machine guns, and are equipped with two-way radio, voice and key, so that commanders can give orders to their units whether they are moving or at a halt. All parts of the regiment move on wheels or tracks. A mechanized cavalry regiment has a tremendous fire power.

Our Army has two mechanized cavalry regiments which are formed together in a brigade, and are supported by mechanized field artillery units. Combat aviation would be attached to this brigade in war.



Cavalry combat cars.

There are 14 regiments of Regular Army Cavalry in the United States—including the two that are mechanized—stationed at 15 different Army posts. There is one horse cavalry regiment of Philippine Scouts at one post in the Philippines. The National Guard has 19 regiments and certain headquarters troops stationed at 126 cities throughout the United States.

The strength of the Cavalry of the Army of the United States, on June 30, 1939, was as follows:

	Regiments	*Officers*	*Enlisted men*
Regular Army	15	914	9, 862
National Guard	19	798	10, 919
Organized Reserves	24	4, 935	224

The Cavalry of the United States Army was originally organized for rough frontier service and achieved many of its greatest successes in the old West. Today the Cavalry uses all modern means of warfare. It is a fast, hard-hitting combat force.

Field Artillery battery in Washington Army Day parade.

The Field Artillery

In battle the Field Artillery fires its accurate and powerful weapons in support of the main fighting arms, the Infantry and the Cavalry. The Field Artillery does not fight alone, but is equipped to defend itself against direct attack by the enemy from the air or on the ground. It gives its strong support to the other arms in battle through the fire power of its cannons, known as guns and howitzers. Its guns fire shells which do not rise far above the earth; its howitzers fire shells which curve high into the air and can thus reach targets protected from the fire of guns by such obstacles as hills.

The units of the Field Artillery are classified according to the caliber (inside diameter) of their weapons, as light, medium, and heavy artillery. They are further classified, according to their means of transport, as horse, horse-drawn, pack, and truck-drawn (motorized) artillery. The guns and howitzers of the Field Artillery vary considerably in range and size of shell, but all are powerful means of warfare. Light artillery is used primarily against enemy personnel and light matériel targets, such as enemy machine guns. Medium artillery is used both to create casualties among the enemy's

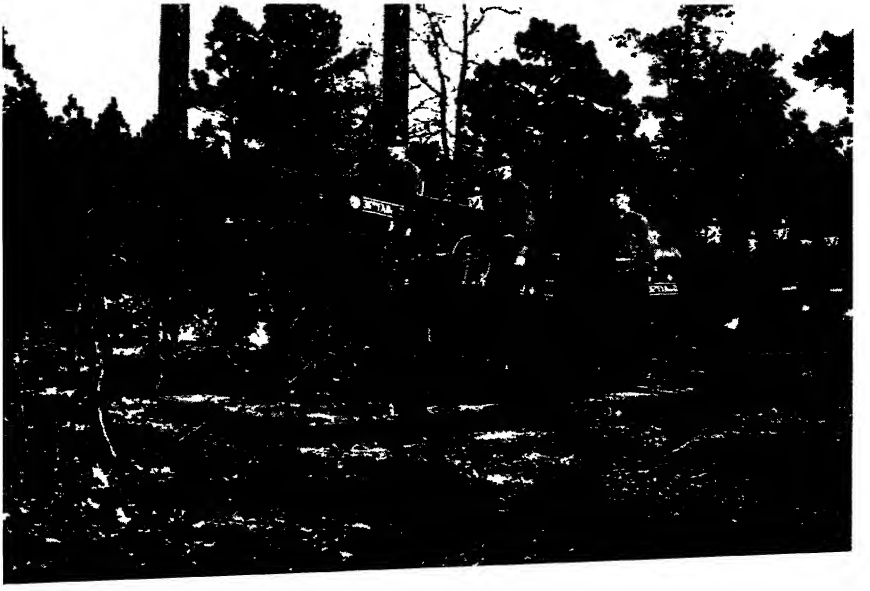
troops and to destroy the enemy's trenches and other kinds of field fortifications, and neutralize (silence) the enemy's artillery. The large shells of heavy artillery are fired mainly to destroy the enemy's defensive works, his guns, and buildings, bridges, and other important installations.

The light artillery of our Army includes the 75-mm. (approximately 3-inch) gun, the 75-mm. howitzer, and the 105-mm. howitzer, which may be horse-drawn or truck-drawn; the 75-mm. howitzer may also be pack-carried. These weapons can be moved rapidly from place to place, and can be put in position, ready to fire, in less than a minute. Light artillery is used mainly in direct support of infantry and cavalry units. Our medium artillery is the 155-mm. (approximately 6-inch) howitzer, which is truck-drawn and almost as fast in movement and action as light artillery. Classed as heavy artillery are the 155-mm. guns, 8-inch howitzers, and 240-mm. howitzers. It takes 1 to 6 hours to emplace and prepare these heavy weapons for firing. They are drawn by heavy tractors.

In detail the characteristics of these weapons are:

Caliber (millimeters)	*Type*	*Range*	*Weight in travel*	*Weight of shell*
		Yards	*Pounds*	*Pounds*
75	Howitzer (pack)	9, 500	1, 470	15
75	Gun, model M2	13, 600	3, 650	15
105	Howitzer	12, 140	5, 750	33
155	do	12, 400	8, 960	95
155	Gun	26, 000	30, 700	95
240	Howitzer	16, 400	58, 600	345
8 (inch)	do	18, 700	29, 600	200

Field Artillery 240-mm. howitzer.



Horse Artillery of cavalry division passing in review

The 75-mm. pack howitzer is carried in six pack loads, the heaviest of which weighs 248 pounds. The 240-mm. howitzer is transported in four separate loads, the heaviest of which weighs 16,200 pounds.

Since the men at the guns almost never see the targets at which they fire, the firing of field artillery is conducted from observation posts connected with the firing batteries by rapidly laid telephone wires and by radio. At these observation posts, the accurate computations required for directing the fire are made, and the fire is adjusted on the hostile targets either by direct observation or by observers in airplanes or captive balloons who communicate by radio or telephone the data on which fire corrections are based. A new development now being tested is the C-6 motorized observation balloon which has many advantages in control and mobility over the World War types of captive balloons for field artillery observation.

The field artilleryman, unlike the infantry rifleman, does not fight as an individual, nor is his gun normally fired as a single unit. To make artillery fire most effective, especially against men or vehicles of the enemy moving rapidly during battle, the guns of artillery are employed in groups. The battery of four guns is the firing unit which fires to cover an area with the burst of its shells, using firing data received from the observation post or from a battalion fire direction center.

The next higher artillery unit is the battalion. The commander of a battalion, assisted by his headquarters, controls and directs the fire of his batteries. Light artillery battalions consist of three gun batteries; battalions of medium and heavy artillery have two gun batteries. Light artillery

Field Artillery 75-mm. pack howitzer going into action.

regiments have two or three battalions, and medium regiments two or three battalions. All artillery regiments have six or nine firing batteries, with a total of 24 or 36 guns.

The largest unit in the Field Artillery is the brigade and there are two kinds of these. One, the division artillery brigade, is a part of the square infantry division, and contains two 75-mm. gun (light) regiments and one 155-mm. howitzer (medium) regiment. The triangular infantry division contains two artillery regiments—one light regiment of three battalions each of three batteries of 75-mm. guns; and one medium regiment of two battalions each of two batteries of 155-mm. howitzers. These regiments are not organized into a brigade as in the square division.

In battle, both in attacking and defending, light artillery is placed in "direct support" of specified infantry elements. This, in effect, forms temporary Infantry-Artillery teams whose close cooperation in combat is essential to success. The artillery part of the team assists the infantry part by furnishing the supporting fire it requires during the battle in accordance with a plan arranged by the infantry and artillery commanders before the fighting begins. The artillery also responds to calls from its infantry for fire upon targets that appear suddenly during the battle. Other artillery units of the infantry division, usually the 155-mm. howitzers, are placed in

Field Artillery 75-mm. howitzer and prime mover, mechanized artillery.

"general support" of the division as a whole rather than in support of designated parts of it.

The second type of field artillery brigade, known as the "corps artillery" brigade, consists of two medium regiments of 155-mm. howitzers and one heavy regiment of 155-mm. guns, and one battalion equipped for sound and flash ranging. This brigade forms a part of every army corps over and above the artillery in the divisions which are in the corps. The primary task of the corps artillery is to neutralize the enemy's artillery along the corps front, thus relieving the division artillery of that important work, and enabling it to use its fire against the enemy's rifle and machine gun units. Corps artillery is also used to reinforce the fires of division artillery.

When a field army is engaged in a major operation it is reinforced by artillery units furnished from the "General Headquarters Reserve" artillery. The field army commander usually retains under his own control only the long-range, high-power artillery, and passes most of the light and medium regiments on down to his corps commanders to strengthen their artillery power. The General Headquarters Reserve artillery comprises regiments of various types and calibers from light to very heavy guns, which form a reserve pool of artillery at the disposal of the field commander of the whole field force in war, to be used as he deems necessary at important sectors of the front.

The field artillery of the horse cavalry division is a regiment of horse artillery equipped with horse-drawn 75-mm. howitzers. At present the

field artillery unit with the mechanized cavalry brigade is a specially equipped motorized battalion of four-gun batteries of 75-mm. howitzers. These batteries have half-track prime movers instead of trucks.

A problem of major importance to the Field Artillery during combat is replenishment of ammunition. A single 75-mm. gun, firing continuously at its sustained rate throughout a 3-hour battle, uses over 500 rounds of ammunition, weighing more than 5 tons. Hence the Field Artillery requires large truck trains for bringing up more ammunition from railway trains or temporary ammunition storage depots well to the rear of the battlefield. Maintenance of communications within artillery units, and between the artillery units and the infantry they support, is also vitally essential to success in battle. For that reason the Field Artillery contains signal communications personnel in all of its headquarters batteries, who lay wire and operate telephone, telegraph, and radio systems connecting gun batteries, observation posts, fire direction centers, and headquarters of the infantry or cavalry units being supported.

The strength of field artillery units varies with classifications as to caliber and means of transport. A light 75-mm. truck-drawn regiment would take the field on mobilization with strengths as follows: each battery, 115; each battalion, 516; each regiment, 1,187. Medium and heavy artillery units are considerably larger since more personnel is required to handle their heavier ammunition, matériel, and motor equipment.

The peacetime strength of the field artillery of the Army of the United States on June 30, 1939, was:

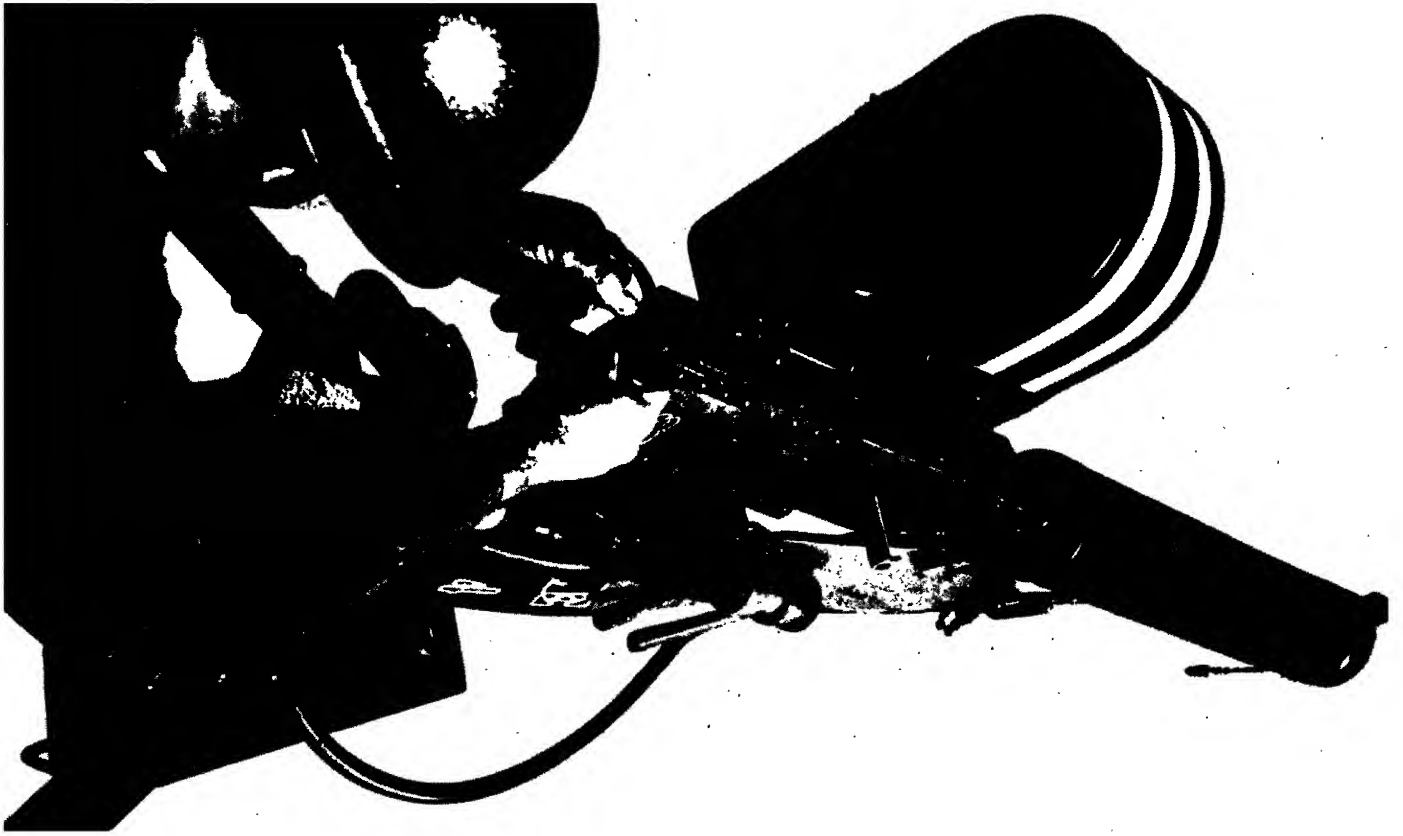
	Officers	*Enlisted men*
Regular Army	1,662	22,638
National Guard	3,195	36,715
Organized Reserves	13,915	386

Critique of firing problem at artillery observation post.

Field artillerymen firing 75-mm. gun.

The Field Artillery of the Regular Army consisted, on that date, of 30 regiments, many of them organized only in part, one observation battalion, and 7 brigade headquarters units, stationed at 19 Army posts in the United States and 3 posts overseas. In the National Guard were 58 regiments at 373 stations in the United States. The supporting power of field artillery is vital to the success of an army in battle.

Field Artillery battery galloping at drill.



Coast Artillery 14-inch harbor-defense gun.

The Coast Artillery Corps

With its fixed and mobile guns capable of firing many miles to sea, the Coast Artillery Corps protects important parts of our shores—mainly the entrances to our largest harbors and ports—from approach by hostile landing forces and from bombardment by hostile navies. In this task of coast defense the Coast Artillery acts in close cooperation with the United States Navy as explained in the section of chapter I dealing with the Protective Mobilization Plan.

The Coast Artillery also has units with powerful antiaircraft guns whose purpose is to protect our most important centers of population and industry, and the main headquarters and installations of our armies in the field, from the war planes of an enemy.

Thus coast artillery regiments are of two main kinds—harbor defense, and antiaircraft. Sometimes two or more regiments are formed into a brigade under a single commander.

Harbor defense regiments are of several kinds. Some are organized to man the big fixed guns in our coastal fortifications. Some operate the railway guns, also of large calibers, which can be moved along the coast for any distance on the railroad lines of our country, and set up for firing out over the sea at any suitable point. Other regiments have guns that can be moved from place to place along our coasts towed by fast heavy

Coast Artillery caliber .50 antiaircraft machine gun.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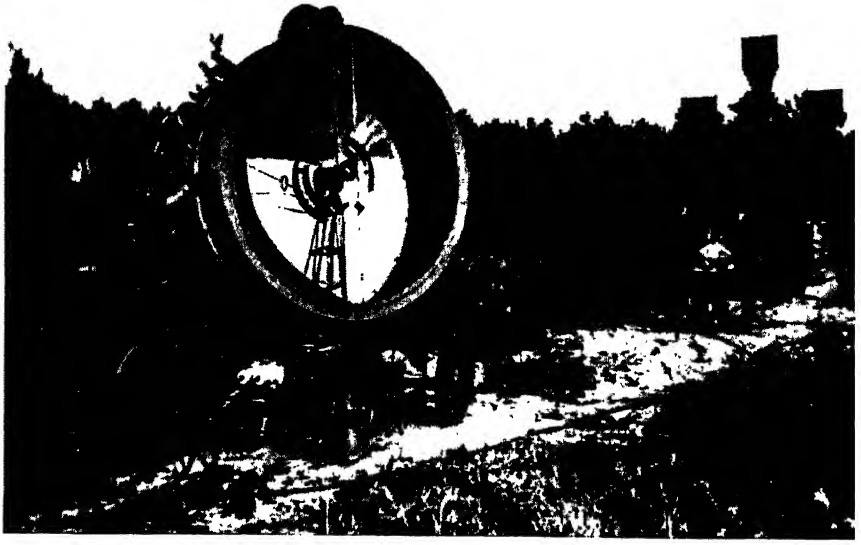

Coast Artillery antiaircraft searchlight and sound locator.

trucks. All of these different regiments include within themselves anti-aircraft units for their own protection.

In its coast defenses the Coast Artillery employs a variety of weapons. The guns of all calibers emplaced to protect our ports and harbors in the 19 harbor defenses of the continental United States, and in fortified areas overseas, range from the 3-inch guns that fire a shell of 15 pounds for several miles, to huge 16-inch guns that can shoot an armor-piercing shell weighing over a ton for more than 20 miles. The three principal kinds of fixed harbor defense artillery are: (1) long-range, heavy guns of 12,- 14,- and 16-inch caliber for the purpose of holding off heavily armored enemy ships; (2) guns of 6-, 8-, and 10-inch caliber, and 12-inch high-firing mortars, for use against enemy ships of smaller types; and (3) rapid-fire guns of 3- to 6-inch caliber capable of protecting mine fields placed in the coastal waters by our own forces, stopping fast enemy torpedo boats, and helping the troops of our Army to repel landings by enemy forces.

Mobile railway and tractor- or truck-drawn units of the Coast Artillery are used to defend our shores against landings attempted at points not protected by fixed defenses. The motor-drawn units are equipped with the 155-mm. gun, which is practically the same as the field artillery gun

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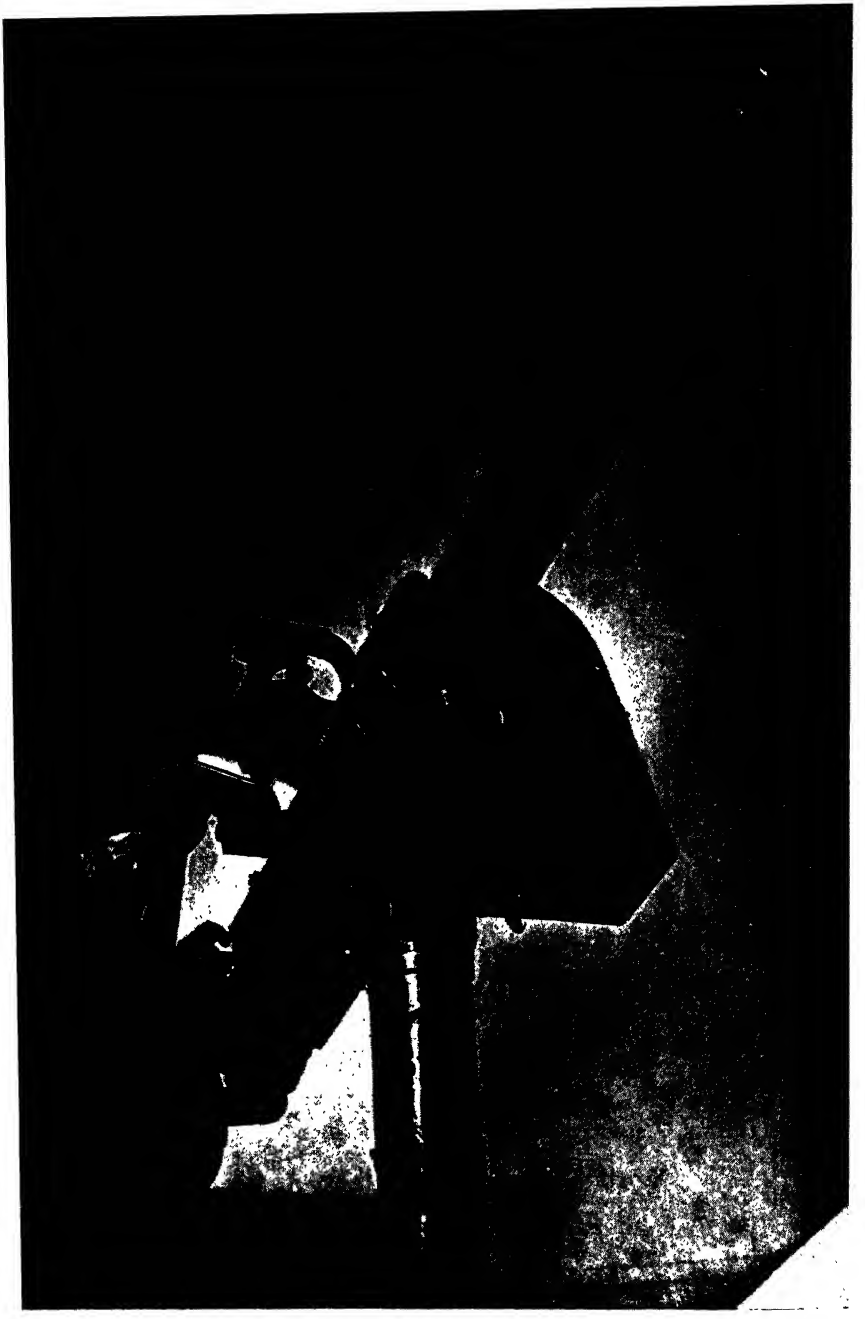
Coast Artillery officers determining antiaircraft defense locations.
Coast Artillery antiaircraft mobile message center.



Coast artilleryman firing caliber .50 antiaircraft machine gun.

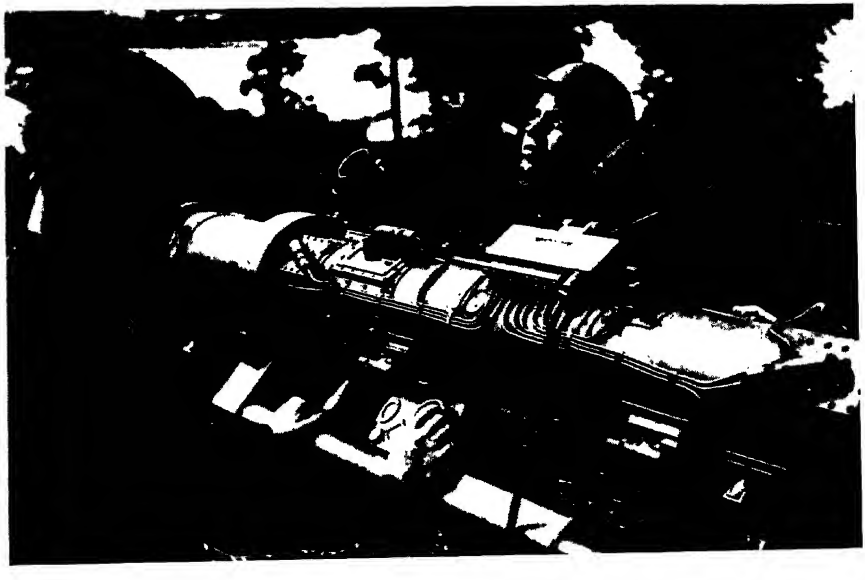
of the same caliber. It can hurl a 95-pound projectile some 10 miles. The weapons of our few railway artillery units are mounted on special railway cars and include 8-inch guns, 12-inch mortars, and 14-inch guns.

The Coast Artillery also lays fields of electrically controlled submarine mines which can be exploded from shore as hostile ships pass over them. To install these mines in channels offshore, and to maintain them, the Coast Artillery uses boats ranging from ocean-going mine planters of over 1,000 tons to small motorboats. At the end of 1939 the corps had a total of eight of the large types stationed at a few of our most important ports.

Our coast defenses are all based on elaborate systems for locating targets out on the water with great accuracy and speed. Since it takes many seconds (sometimes more than half a minute) for the big shells to travel from gun to target (an enemy ship), and since the target may be moving fast, the fire must be directed at the point where the ship will be when the projectile travels to it. The position of the target, in other words, must be predicted for each shot, and shells must sometimes be fired at a point half a mile ahead of the moving target. The effect of the wind, the temperature, and even of the earth's curvature must also be calculated for each shot fired. All these calculations moreover must be made, and the guns pointed correctly, in seconds rather than minutes. In consequence, harbor defenses contain observation stations, plotting rooms, searchlights, and elaborate communication equipment.

In contrast to the heavy weapons of harbor defense units of the Coast Artillery are the light, fast-moving guns of the antiaircraft units. The batteries of antiaircraft must detect and hit targets that fly several hundred miles per hour. They must also move rapidly to reach new firing positions in protecting a moving army. There are a few fixed antiaircraft guns at

Coast artillerymen using aircraft height finder.



vital points, but all the rest are motorized and can move on highways—guns, searchlights, and all—at high speeds. Regiments of antiaircraft artillery are capable of traveling more than 300 miles in a single day.

The present standard weapon of Coast Artillery antiaircraft units is the 3-inch antiaircraft gun. It is very accurate and fires a 13-pound projectile which is effective against enemy planes up to 4 miles altitude. The shells have time fuzes which are set to burst in the air among the enemy's airplanes. It is not necessary to make a direct hit on a hostile airplane to destroy it. In 1 minute a battery of 4 guns can fire 100 aimed shots. Each antiaircraft gun battery has a director, or "mechanical brain." This complicated instrument is pointed continuously at any air target and automatically computes the right direction for pointing the guns and transmits it electrically to dials on each gun. The gun crew simply read the dials and turn other dials to point the gun rapidly in the right direction.

Antiaircraft guns are supplemented by searchlights of approximately 800,000,000 candlepower which illuminate targets at night. To enable the searchlight crews to find the targets quickly as they approach high in the air over the guns, sound locators are used. These are really huge aids to hearing by which trained listeners can tell the direction from which the sound of approaching airplanes is coming, so that the searchlights can be pointed in that direction and can light up the targets accurately at the earliest moment possible. The searchlights, of course, are placed in a circle at a considerable distance from the gun batteries. Farther out, and in a much larger circle, are ground observers who give advance warning to the whole antiaircraft defense. All this equipment requires the production of considerable electric power in the field and the use of complex and delicate control instruments by highly trained personnel. An antiaircraft battery of four guns, with its searchlights, may install as much as 100 miles of telephone wire when it occupies a single position.

The antiaircraft guns of the 3-inch type, built for long-range firing, are not effective for firing at low-flying airplanes at short range. To deal with "hedge-hopping" enemy attack planes, lighter weapons are necessary which can go into action instantaneously and develop a large volume of automatic fire. For this purpose we use at present the Browning caliber .50 machine gun and the 37-mm. antiaircraft gun. The caliber .50 machine gun fires a stream of tracer bullets which are half an inch in diameter. The tracers burn with a bright light, so that the gunner's eye can follow this stream of destructive fire power for nearly a mile. Each machine gun

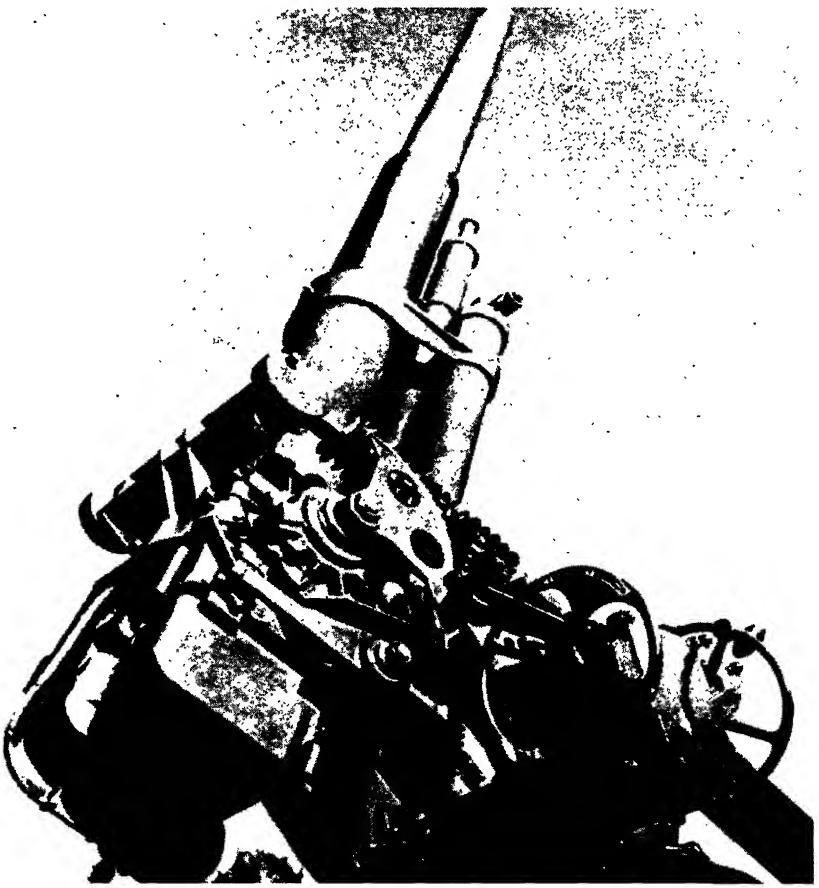
Coast Artillery antiaircraft director.
Coast Artillery 3-inch antiaircraft gun.

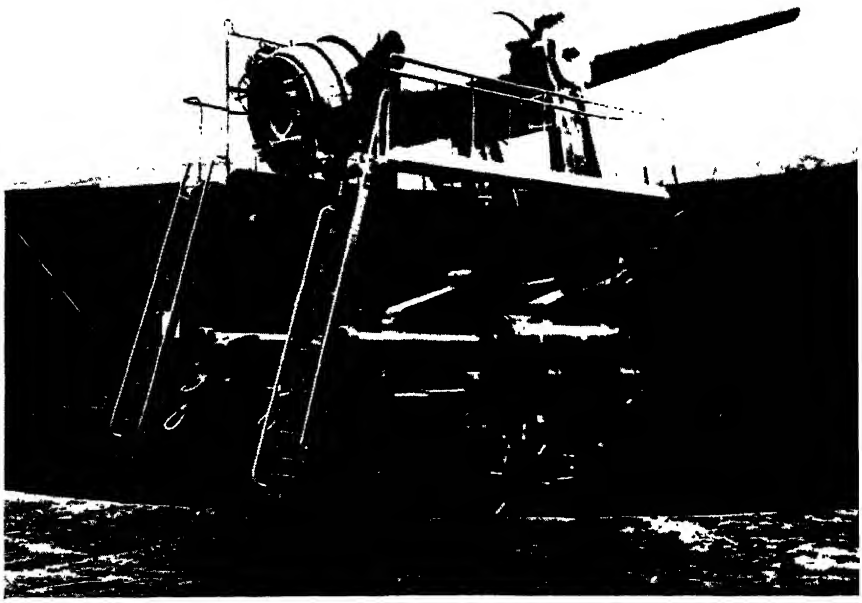
pours fire at aerial targets at a rate of several hundred rounds per minute. The 37-mm. gun fires a small shell weighing about a pound also at a rapid rate and is a most powerful modern antiaircraft weapon.

A war-strength antiaircraft regiment contains one searchlight battery (15 searchlights), 3 gun batteries (with a total of 12 3-inch guns), 3 batteries of 37-mm. guns (with a total of 24 guns), and 1 machine-gun battery of 12 machine guns each (48 altogether). Coast Artillery, however, has no monopoly of antiaircraft machine-gun fire. The troops of all other arms and of some of the services fire on low-flying enemy airplanes with rifles, automatic rifles, and machine guns. The antiaircraft units of Coast Artillery supplement their fires and provide antiaircraft protection at various localities where such protection is not furnished by other arms themselves.

On June 30, 1939, there were five Regular Army Coast Artillery antiaircraft regiments and ten National Guard regiments. The Army expansion legislation of 1939 authorized the completion of essential articles of equip-

Coast Artillery 3-inch antiaircraft gun.





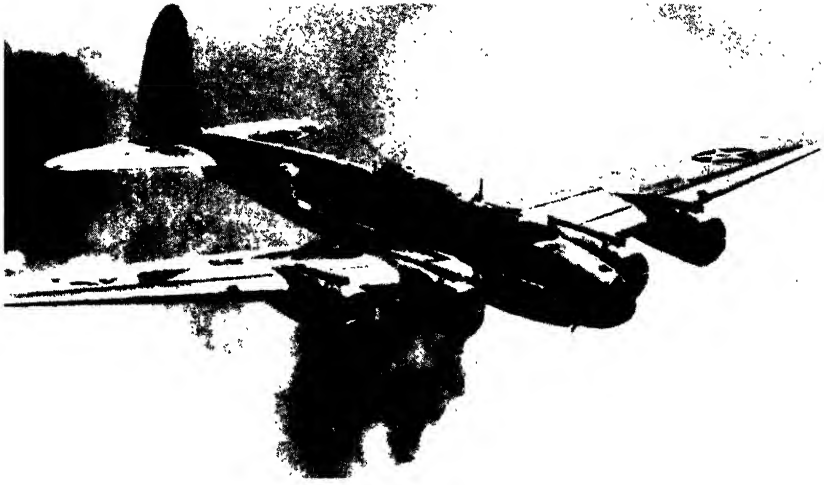
Coast Artillery 12-inch harbor-defense disappearing gun.

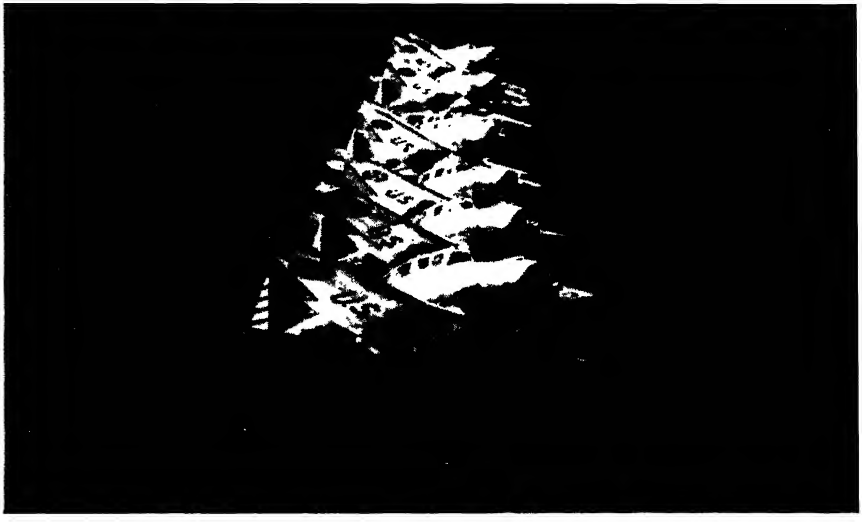
ment for these 15 regiments and the procurement of guns and other major articles of equipment for 22 other antiaircraft regiments to be organized.

The strength of the Coast Artillery Corps in the three components of our Army (harbor-defense and antiaircraft) on June 30, 1939 was:

	Officers	*Enlisted men*	*Number of regiments*
Regular Army	1,068	18,921	29
National Guard	926	13,774	25
Reserves	8,753	244	57

Of the 29 Regular Army regiments, on this date, 18 were in the United States, and 11 were overseas. The National Guard had 10 mobile antiaircraft regiments and 15 harbor defense regiments of various types at 121 stations in the United States. The seacoast artillery regiments of the National Guard are assigned to existing harbor defenses, and during their annual periods of field training usually fire target practices with the guns that they would man in time of war.





Seversky *P–35* pursuit planes in formation.

The Air Corps

The Air Corps is the arm that contends with enemy forces of the air, attacks his ground troops from the air, and destroys by bombing his supply depots, his factories where war supplies are made, and his military installations of all kinds. A modern and powerful air arm is one of the main reliances of our Army for the defense of the Nation. The air units of the United States Navy would, in war, cooperate with the fleets of the Navy to destroy hostile ships and thus keep an enemy from our shores. The Air Corps of the Army, however, would cooperate and help as needed against an enemy's forces on the seas, though it is organized primarily for operations against the enemy in the air and on the land. The Air Corps expansion program of 1939 authorized an increase in the number of Air Corps planes to 6,000, with funds appropriated for 5,500.

The General Headquarters Air Force is the strong fighting force of the Air Corps as distinguished from other Air Corps units which are auxiliaries to large ground units. In war, the General Headquarters Air Force comes directly under the orders of the commanding general of the whole Army, whereas the other Air Corps units are under the orders of field army, army corps, and division commanders.

The Air Corps has three basic types of combat airplanes: pursuit, bombardment, and observation. Pursuit airplanes are of two types: interceptor and fighter. Interceptor airplanes are primarily used for meeting and de-

"The Flying Fortress" (Boeing *B–17*) bombardment airplane.

Northrop A-17-A attack airplane.

stroying hostile aircraft attacking objectives in our own territory. Fighter pursuit airplanes accompany bombardment planes and protect them against attack by hostile pursuit airplanes. Bombardment airplanes are of three general kinds: light, medium, and heavy. Light bombardment airplanes are designed to give fire support to ground troops by machine-gun fire and bombs. Heavy bombardment airplanes are designed for long-range bombardment and reconnaissance flights over land or sea. Medium bombardment airplanes are lighter and less expensive, and are designed for bombardment or reconnaissance missions that do not require extreme range. The purpose of observation airplanes is to furnish short-range observation, photographic, command, courier, and liaison service to corps and divisions, including their component infantry and artillery units. Observation service includes both visual and photographic reconnaissance and air-ground radio communication. All of these combat types of airplanes are armed with machine guns for self-defense against enemy airplanes and have as much speed as their weights and engines will permit.

There are three kinds of basic noncombatant airplanes: training, cargo and transport, and experimental. The training planes are of various types including primary, basic, and obsolescent service types. Transport and cargo airplanes are used to carry both troops and supplies. Experimental airplanes are those under development.

The Air Corps strength as of June 30, 1939, was as follows:

	Officers	*Enlisted men*
Regular Army	1,670	20,838
Reserve on extended active duty	846	.....
National Guard	468	1,848
Other Organized Reserves	2,156	402

The Army expansion program of 1939 authorized a substantial increase in the enlisted ranks of the Air Corps, the new total being 45,000. This

Douglas *B–18* medium bombardment airplanes.

increase will be reached early in 1940. This same legislation increased also the Regular Air Corps officer personnel to 3,203 over a period of 10 years. While this officer increase is being accomplished, however, Reserve Air Corps officers in sufficient numbers to maintain a total of 4,663 Air Corps officers will be kept on active duty, and 1,460 Reserve officers will be kept on extended active duty tours after the 10-year period is completed.

Air Corps units are organized into units with approximate numbers of planes as follows: subflights (3–5), flights (6–8), squadrons (13–28), groups (61–121), wings (125–250).

The commissioned strength of the Air Corps is obtained from three sources: graduates of the United States Military Academy who successfully complete flying training and are transferred to the Air Corps; second lieutenants commissioned from civil life after Army training as flying cadets; and Reserve officers. Instruction of prospective flying officers is given in part at civilian flying schools and in part at the Air Corps Training Center at San Antonio, Tex., which is described in a later chapter.

Air Corps bases and stations are of several kinds. At group, squadron, and wing bases are the planes and personnel of Air Corps units, and the shops to maintain them. There are also Air Corps schools for training, experimental establishments, Reserve stations where planes and instructors are maintained to give the Air Corps Reserve an opportunity for flying

Lockheed *XP–38* pursuit airplane.

duty, National Guard fields, and corps area and airways detachments, where small units maintain the planes attached to corps area headquarters and provide servicing facilities on Army airways.

The Air Corps had, on June 30, 1939, a total of 83 stations. Of these, 41 are Regular Army flying fields, 35 in the United States, and 6 overseas. In the United States, also, are 19 National Guard stations and 17 Reserve stations. Several new air bases in the United States, and in Puerto Rico, Panama, and Alaska, were authorized by legislation in 1939.

The Air Corps maintains an important experimental unit, the Matériel Division, at Wright Field, Dayton, Ohio, the work of which is of much direct benefit to civil aviation as well as to military. In the extensive laboratories at this station, new types of planes, engines, and accessory equipment are developed and are tested in experimental flight. The experiments in substratosphere flying conducted here have been of particular importance to the future of flying. In this work pressure cabins are being perfected which give full protection to flyers from the ill effects of low atmospheric pressure at high altitudes. It was also through conclusive Air Corps tests that the physical hazards of high flying have been established.

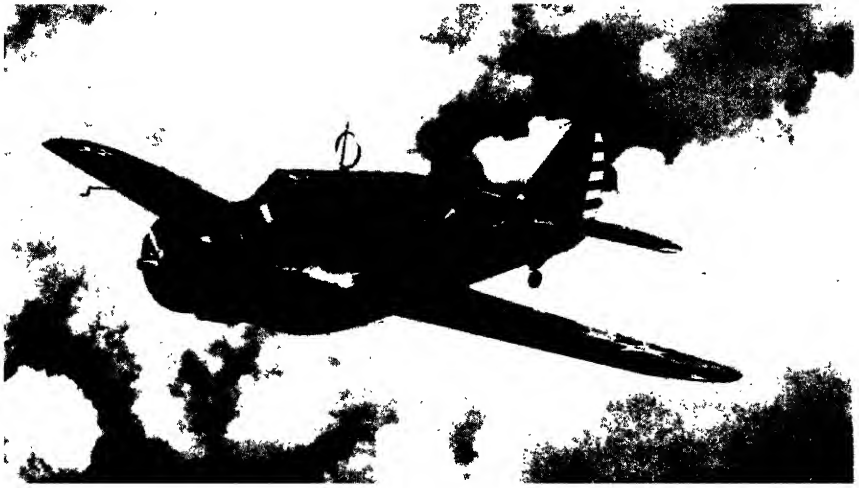
Bell *XFM–1* pursuit airplane (multiplace).
Curtiss *A–18* attack airplane.
Curtiss *P–36* pursuit airplane.
Curtiss *XP–40* pursuit airplane.

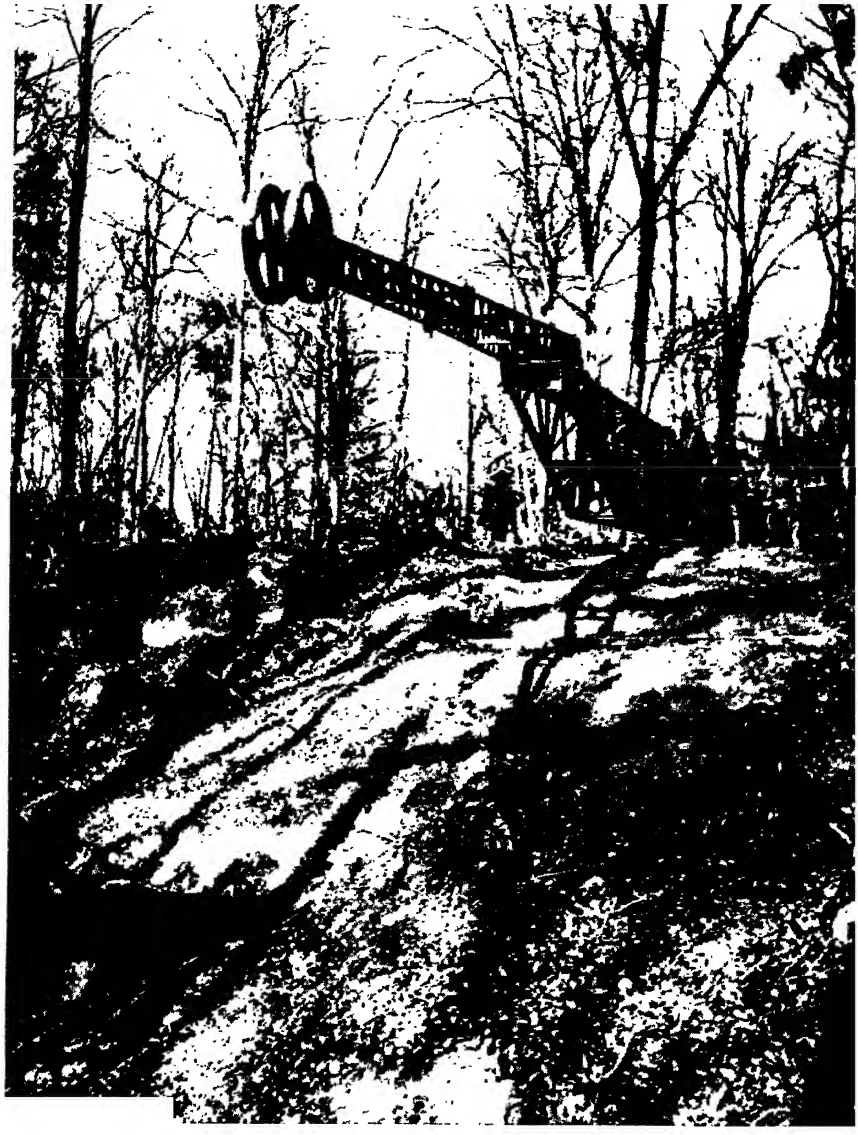
Other important experimental developments at Wright Field are those concerned with automatic landing devices; engines of 2,000 horsepower and more; and other accessories, materials, and designs to increase the safety and speed of flying.

The Air Corps is also charged with coordinating plans with civil industry, under the Assistant Secretary of War, for wartime plane, engine, and equipment production. The Air Corps gives assistance and advice to the Works Progress Administration and civic authorities with regard to locations of civil airports. It makes special reconnaissance and photographic flights to assist the various mapping activities of the Government, and it surveys flooded areas to obtain data on the extent of floods as they spread. Air spraying to kill insects was originated by the Air Corps and the Chemical Warfare Service. The Air Corps cooperates with the National Geographic Society in the exploration of the stratosphere. With the Bureau of Standards, the Air Corps tests raw materials and alloys for air use. Army aviators fly on many emergency missions in time of disaster when rapid means of communication or transportation are needed in the relief of the stricken areas.

The weather service of the Army Air Corps is another activity that contributes to safe flying in general. There are three Air Corps weather squadrons with headquarters at March Field, Calif., Barksdale Field, La., and Langley Field, Va., and detachments at many other fields in the United States. At all these fields weather reports and forecasts are issued and are available to all flyers, military, private, or commercial. These Air Corps reports and forecasts are also issued hourly by radio through arrangement with many commercial radio stations which are located near Army air fields. Thus military aviation assists flyers throughout the United States.

North American *O–47A* observation airplane.





Engineers constructing portable steel bridge; first stage.

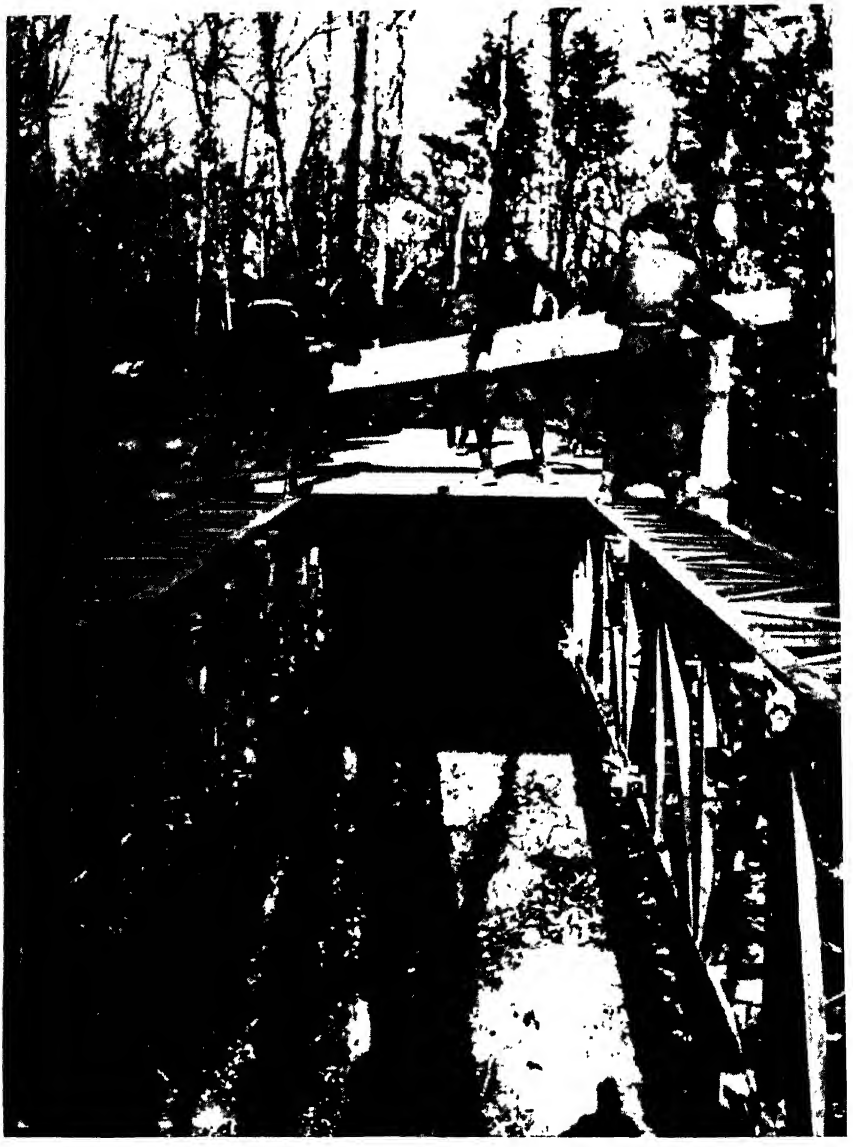
The Corps of Engineers

The Corps of Engineers is the arm that furnishes technical engineering skill to the Army of the United States, in peace and war, and directs much Government engineering work of a nonmilitary or partly military kind.

Engineers constructing portable steel bridge; second stage.

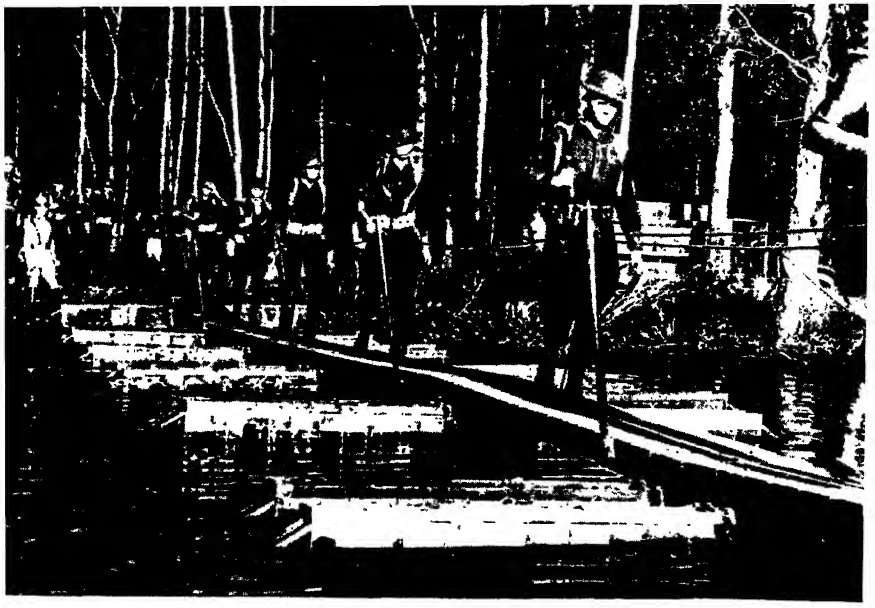
It is also a fighting arm. When a need for reserves of combat troops arises more pressing than the need for their engineering work, units of combat Engineers go into battle against the enemy like Infantry.

The tasks of the Engineers in war are many. They build, repair, and maintain buildings, bridges, and structures of every kind, except telephone and telegraph systems and other means of signal communication for the use of troops. They conduct military mining, which consists of digging tunnels under enemy fortifications and demolishing them. They blow up bridges, viaducts, and roads when this is necessary, and may also destroy captured guns, stores, and other materials by explosives. They also protect



Engineers constructing portable steel bridge; third stage.

our own forces against enemy mining. One of the most important tasks of the Corps of Engineers in war is that of road construction. They build and maintain extensive systems of roads for the use of the Army, both in the areas of combat and in the supply areas to the rear of the combat zone.



Troops crossing engineer foot bridge.

The Engineers operate railways, electric light and power systems, water supply systems, and all other utilities, except some that are specifically assigned to other branches. They obtain, store, and issue all materials for construction, for building defense systems, and for all other engineering work, including all plants, tools, and appliances for such work.

Another important job of the Engineers is surveying and mapping. This work includes not only preparing maps but producing them in quantity by printing or other means, and distributing them to the other arms and services at the earliest possible moment for tactical and strategical use.

All of these many tasks of the Corps of Engineers have two simple purposes in war. One is to make the movement and supply of our own Army easier. The other is to hinder the movement of the enemy's army.

In war, engineer "combat" regiments operate in the forward part of the combat zone mainly to assist the other fighting arms. They are assisted by engineer "general service" regiments and "separate" battalions which are equipped to do all kinds of engineering work. Depot companies operate storage places of engineer materials, and ponton-bridge units are equipped and trained to build floating bridges rapidly across rivers. There are also a number of special Engineer Corps units, such as camouflage, ponton, railway, water supply, and topographic (mapping) battalions, and dump truck and shop companies.

Engineer units are largely motorized. All have modern and efficient engineering equipment. A portable air compressor, equipment in each Engineer combat regiment, furnishes compressed air to operate a cross-cut saw, a hammer for breaking stone, and a pile driver.

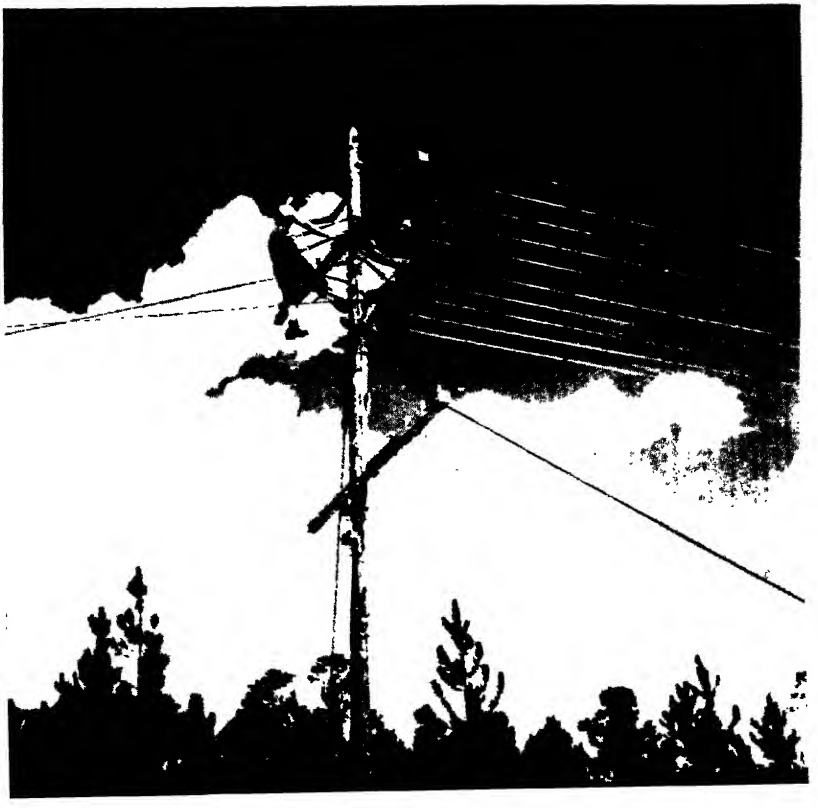
Our small peacetime Corps of Engineers not only trains for its tasks in war but also furnishes skilled engineering personnel to direct rivers and harbors improvement, flood control, and other public works. These activities are described in a later chapter.

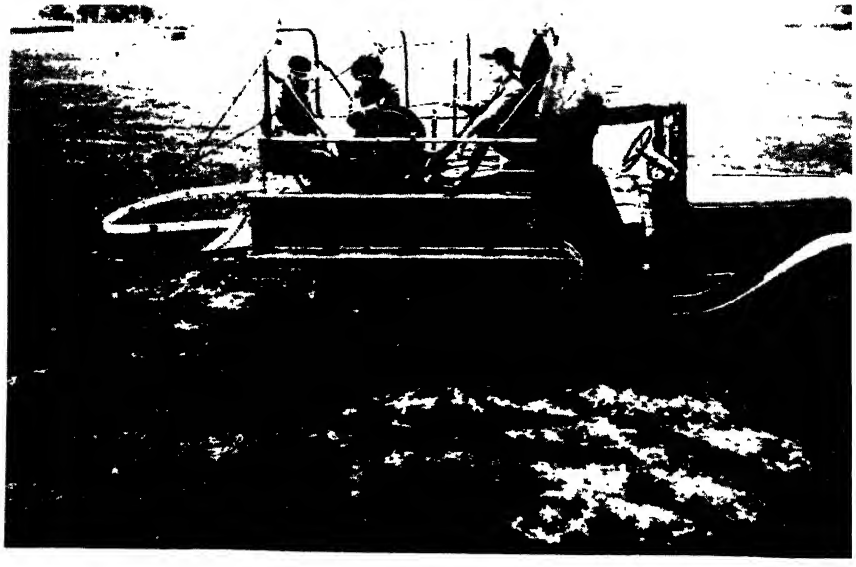
On June 30, 1939, the units of the Corps of Engineers in the three components of the Army of the United States were as follows:

	Officers	*Enlisted men*
Regular Army	782	5, 481
National Guard	495	8, 205
Reserves	7, 828	41

Some 245 officers of the Corps of Engineers were on river and harbor work on that date, and about 75 others were on such duties as the Panama Canal, the District of Columbia Government, the Works Progress Administration, and the Battle Monuments Commission.

Signal Corps linesman.





Signal Corps half-track, wire-laying vehicle.

The Signal Corps

The Signal Corps trains the communication men of the Army. The Signal Corps speeds the Army's messages by motorcycle, airplane, homing pigeon, telephone, teletype, telegraph, and radio. It also develops, procures, and supplies signal, meteorological, and photographic equipment for the Army; and it produces photographs and moving pictures for purposes of training and for historical record.

In war, troops of the Signal Corps handle all signal communication at the headquarters of divisions and larger units and at the general headquarters of the whole Army. The Infantry, Cavalry, and Field Artillery install and operate their own signal communication systems in the forward battle areas.

When there are commercial telephone and telegraph lines in the area of operations in war, the Signal Corps leases them, using wires, poles, and offices for Army purposes. For wire lines close to the fighting front, field wire is laid on the ground from Signal Corps cross-country trucks and from man-drawn and man-carried reels. Breaks often occur in these lines during battle, and they must then be repaired as quickly as possible so that higher commanders can keep contact with their fighting units.

Signal Corps radio.

Linesmen must leave their shelters, follow the wire, and often repair the line under fire. The Signal Corps is therefore one of the combat arms.

The Army uses commercial types of telephones, switchboards, and teletype instruments in the rear areas and as far to the front as commercial electric power plants can be kept in operation. The Signal Corps operates such plants on Army posts for local service, thus keeping efficiently trained to operate the systems and switchboards of large headquarters in time of war. In forward areas in the war zone the Signal Corps uses its own specially designed field telephones, telegraphs, and radios.

Radio also finds extensive use in the Army. The Signal Corps has several types of long-range sets which are carried in trucks and operated from buildings or tents at important headquarters. There are also light sets carried by hand and operated in the open or from trenches or dugouts, and cavalry sets carried by pack horse and operated either from the backs of the animals or on the ground. There are special voice and key sets for tanks and armored cars and for airplanes. The Air Corps' special radio equipment includes radio beacons, radio compasses, sets for work between planes and between planes and the ground, and interphone equipment through which the crew members can talk to each other in the planes.

The Army operates its own net of fixed radio stations. Through this system the War Department keeps in direct and rapid touch with the whole Army both in the United States and overseas. Washington is connected directly with corps area and department headquarters at Boston, New York, Baltimore, Atlanta, Columbus, Chicago, Omaha, San Antonio, San Francisco, Panama, and Hawaii. Manila is tied in through both Hawaii and San Francisco, and the Alaska communication system is connected through Seattle. Each of these large headquarters is the control station for its own net through which the corps area and department commanders communicate with the Army posts in their areas. There are 146 stations in this Army system.

Of the approximately 50,000 licensed amateur radio operators in the United States, the Signal Corps has selected some 1,200 for their operating skill and reliability, and has organized them on a volunteer basis into various corps area, State, and regional nets in the Army Amateur Radio System. This system has given most valuable service in floods and other disasters and a number of its members have been cited for their splendid work and devotion to duty.

The Signal Corps is charged with intercepting enemy radio messages, locating enemy radio stations by radio goniometry, and supervising the Army's own radio service. Radio intelligence companies carry out these duties.

Before new commercial products and inventions in the field of signal communication can be adapted to military use, considerable modification, or

Signal Corps filming a training scene.

even complete redesign, is usually necessary. Such work is done on aircraft radio equipment at the Signal Corps Aircraft Radio Laboratory at Wright Field, Ohio. Development of telephone, telegraph, meteorological, radio, and all other Army signal equipment except aircraft radio, is done at the Signal Corps Laboratories at Fort Monmouth, N. J.

The Chief Signal Officer is charged with signal industrial mobilization and supply planning for war, under The Assistant Secretary of War. These planning activities are carried on at Washington, Brooklyn, Chicago, and San Francisco. Commercial factories are surveyed to determine their ability to produce different types of equipment needed for war.

In the World War, the need for men in France almost drained the country of trained units so that few demonstration and training troops were available. In another war, training films will play an important part in showing the new soldiers how to handle their equipment and care for themselves in the field. The Signal Corps produces a number of these training films each year for the instruction of all arms and services.

In war, the homing pigeon is still a reliable and rapid way to send messages when other means are not at hand. The Army must depend on the

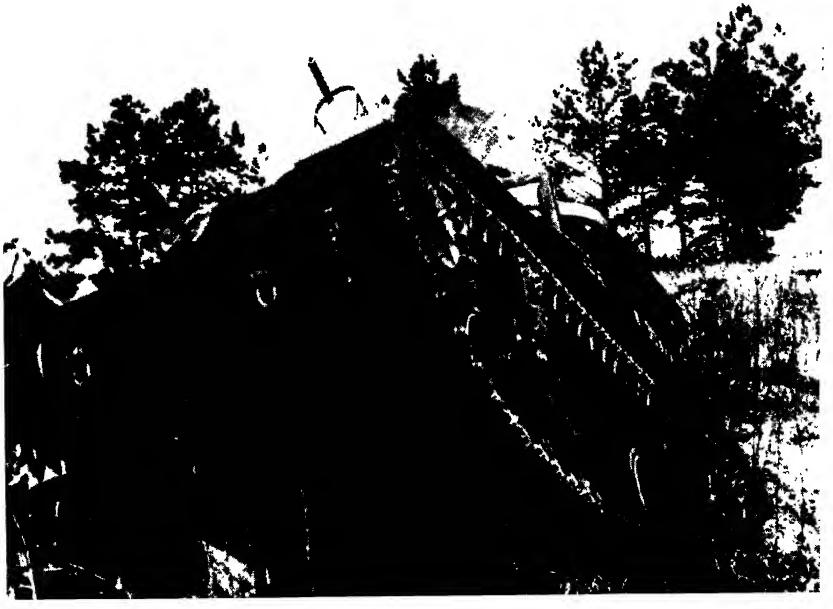
thousands of pigeon fanciers of the country to supply the large number of birds that will be needed in a possible war.

The strength of the Signal Corps, on June 30, 1939, was as follows:

	Officers	*Enlisted men*
Regular Army	288	3,687
National Guard	145	1,908
Organized Reserves	2,262	9

In the Regular Army there are 2 signal battalions, 5 infantry division signal companies, 2 radio intelligence companies, and 1 cavalry division signal troop, in the United States and in overseas stations. In the National Guard there are 1 signal battalion, 18 infantry division signal companies, 2 radio intelligence companies, and 1 cavalry division signal troop.

Infantry tank.



Barracks at Fort Sam Houston, Tex., constructed by the Quartermaster Corps.

CHAPTER III

THE SERVICES

THE "services" of the Army help the fighting arms. These branches relieve the fighting arms from the burden of such activities as supply, administration, and hospitalization. The Adjutant General's Department assists the Army's high commanders in issuing their orders and in the management of the Army's daily business in many important ways. The Inspector General's Department is the inspecting service and makes suggestions for the improvement of the Army. All legal matters in which the Army is concerned are attended to by the Judge Advocate General's Department. The Quartermaster Corps obtains and furnishes food, clothing, and equipment of various kinds. The immense supplies of arms and ammunition needed for national defense are obtained and distributed by the Ordnance Department and the Chemical Warfare Service. The Medical Department cares for the Army's sick and wounded and administers its hospitals. The Finance Department pays out and accounts for the funds Congress appropriates to support the Army. The Corps of Chap-

lains cares for the spiritual and moral needs of the Army. Like the arms, the services each have a chief with headquarters in Washington.

These branches are called "services" because they serve the fighting arms.

The Adjutant General's Department

The Adjutant General is charged with the duty of recording, authenticating, and communicating to troops and individuals in the military service of the United States all orders, instructions, and regulations issued by the Secretary of War through the Chief of Staff or otherwise. He arranges and preserves the records of the military establishment in his custody and of all War Department administrative business concerning those records. The functions of his office include procuring officers for the Army, preparing and issuing commissions, handling correspondence, and conducting examinations of candidates for admission to the United States Military Academy and issuing their appointments. Enlisted men for the Regular Army are obtained through a widespread recruiting service controlled by the Adjutant General's office, through the agency of the corps area commanders. This activity reaches practically every city of size in the country and obtains thousands of recruits each year. Among its various other duties, the Adjutant General's office, in conjunction with the corps area commanders, procures candidates for admission to Citizens' Military Training Camps, the Officers' Reserve Corps, the Enlisted Reserve Corps, and the Reserve Officers' Training Corps, and in cooperation with other Government agencies, participates in matters dealing with the general administration of the Civilian Conservation Corps. The Adjutant General also handles matters pertaining to the education and recreation of enlisted men, including the Army motion picture service; governs and controls, under the Secretary of War, the United States Disciplinary Barracks and its branches; conducts extensive correspondence concerning the military service generally; and publishes and distributes War Department regulations, manuals, and other documents. He considers all applications for awards of military decorations and service medals, and carries out many other duties of importance to the Army.

At the larger headquarters of Army units such as corps area and department headquarters and the headquarters of infantry and cavalry divisions, General Headquarters Air Force, and air corps wings, there is a similar need for careful supervision of administration. Officers of the Adjutant General's Department are therefore assigned to the staffs of these commanders, to perform for their commanders duties generally similar to those of The Adjutant General under the Secretary of War, as described above.

The Adjutant General's Department consists of The Adjutant General, with the rank of major general, the Assistant The Adjutant General, with

the rank of brigadier general, and approximately 100 officers each of whom is called "Adjutant General", with rank from captain to colonel. Of these, about 30 are assigned to the Adjutant General's Office in Washington, and 70 to the headquarters of the corps areas, overseas departments, and tactical divisions. Some of these are officers of other arms or services who are serving a tour of several years as adjutant generals. In addition, there are some 750 Adjutant General's Department Reserve officers in the Organized Reserves, and 140 in the National Guard.

The Adjutants General of the States and Territories are State officers, responsible directly to the Governors. Most of them also hold Federal commissions in the Army of the United States and thus also belong to the Adjutant General's Department, and perform both Federal and State duties. Their State offices, however, are not branches of the Adjutant General's Office in Washington.

The Adjutant General's Office occupies several widely scattered buildings in Washington which contain about 10 acres of office floor space. The office houses approximately 656,000,000 records, involving more than 33,000,000 men who have been connected with the United States Army at one time or another since 1776. The 30 officers and more than 800 civilian employees in this office handle a peacetime volume of business of about 3,000,000 cases each year.

In the historical files of The Adjutant General are such priceless documents as the original oath of office of General Washington and his officers at Valley Forge in 1778, including the oaths signed by Lafayette, DeKalb, and other foreign officers who aided the American cause; President Lincoln's personal telegrams, 1864–65, most of them in his own handwriting; the draft records of the Civil War; records of the Freedmen's Bureau; the State Papers of the Confederacy, and many others.

These millions of documents are contained in approximately 100,000 filing cases. Those relating to individuals are arranged as a general rule alphabetically. World War personnel and all officers and enlisted men entering the Army since the World War are also identified by serial numbers. How reliable this filing system is can be seen from the fact that during the World War there were 50,328 men named Smith; 40,101 named Johnson; 28,902 named Brown; and 27,938 named Williams. Yet if John Smith should need a copy of his military record during the World War for any legitimate purpose and should write to The Adjutant General giving his name and serial number, his record could be quickly found and furnished to him.

The Adjutant General's Office also receives thousands of requests daily from the general public, by letter, telephone, and personal visit, for military and medical records of individual soldiers. The office furnishes in-

formation to the Veterans' Administration to form the basis for decisions upon claims of veterans for benefits under the various laws providing pensions, hospitalization, and compensation.

Contrary to a rather widespread belief, the records of the War Department are not "public records" in the full sense. The records of individuals are regarded as confidential, and are public only to the extent that information from them is furnished to committees of Congress, to other departments of the Government charged with settling claims, to courts entitled to see such records, and to individuals themselves for legitimate reasons. However, all inquiries received are answered and every effort is made to comply with proper requests for information.

As now organized, the Adjutant General's Office consists of eight major divisions, each handling a particular class of inquiry and certain specific types of work. The mail is opened, classified, and distributed to these divisions for action. A corps of correspondents answers promptly all inquiries, and response to any important inquiry seldom takes more than 2 or 3 days. Except in unusual cases all requests are sure of attention within a week or 10 days. As a convenience to the public, to Members of Congress, and to other parts of the Government, the Adjutant General's Office maintains a large information and coordination section.

The Adjutant General's Office is organized to permit great expansion in time of national emergency. At the beginning of our participation in the World War in 1917 there were 686 civilian employees on the rolls. By the end of the war there were nearly 5,000. Throughout the whole period the office functioned smoothly and with remarkably few errors in its system of record keeping and in its handling of current work.

The Inspector General's Department

The Inspector General's Department is an instrumentality placed at the disposal of the Secretary of War to assist him in the administration of the War Department and the Army of the United States. This assistance is furnished by means of periodic inspections and special investigations. The department consisted after June 30, 1939, of The Inspector General, with the rank of major general, and 64 commissioned assistants of the grades from major to colonel, all detailed in the department from various arms and services. In the National Guard and Officers' Reserve Corps, inspectors general are detailed in a similar manner. Twenty-seven warrant officers are on duty with the Inspector General's Department as assistants to corps area and department inspectors general. The department has no regularly assigned enlisted men.

The Inspector General's Office, located in Washington, D. C., operates directly under orders from the Secretary of War. This office consists of

The Inspector General, 11 officer assistants, and a number of civilian employees. In addition to inspecting activities directly under War Department control, and making special investigations ordered by higher authority, this office receives for review and recommendation all reports of inspections and of special investigations requiring action or decision by the War Department.

One inspector general and an appropriate number of assistants are assigned to duty with the staff of the commanding general of each corps area and department. They make inspections, investigations, and reports as required by law or ordered by proper authority. One inspector general is assigned to the staff of each Regular Army division to carry out similar duties for his division commander.

Periodic inspections are made of all Army posts, camps, and stations, the United States Military Academy, all service schools, general hospitals, armories, arsenals, depots, disciplinary barracks, recruiting stations, national cemeteries, and Army transports, and the United States Soldiers' Home in Washington. Money accounts of Regular Army disbursing officers, National Guard units, and accounts of the United States property and disbursing officers in each State are also inspected periodically. In each corps area the annual inspection of National Guard units is coordinated by the Inspector General in cooperation with the officer in charge of National Guard affairs.

In conducting all these inspections, inspectors general inquire into and observe the conduct, discipline, and efficiency of officers and troops. They report with strict impartiality all irregularities and deficiencies they observe, and when it is appropriate to do so, make suitable recommendations for correction. Investigations are made with a view to correcting abuses, settling grievances or complaints, and providing corrective or remedial measures for any undesirable condition which may be found to exist. When proper authority orders them, investigations are made into the conduct and actions of individuals.

From the very nature of the duties of inspectors general, it is obvious that they must make adverse reports on conditions which, in their opinion, involve serious, undesirable, or irregular occurrences. But much is also done to prevent such occurrences. This they do by discovering, pointing out, and correcting many irregularities, deficiencies, and faulty methods of operation, minor in themselves, but which, if allowed to continue, might become serious.

Inspectors general have no authority to render decisions or to impose punishment. They simply report all the available facts which they observe in conducting their inspections, and submit impartial conclusions and recommendations. Thus the Inspector General's Department is primarily an organization for finding and reporting facts concerning the Army.

The Judge Advocate General's Department

The Army of the United States has its own system of laws for carrying out military justice. The Army is also affected in many ways by laws that are not purely military. Hence it requires constant expert legal advice on nearly all kinds of law. The Judge Advocate General's Department is the legal advisory service of the Army.

This department consisted, on June 30, 1939, of one Judge Advocate General with the rank of major general, and 100 officers, including 11 detailed from other branches, called "judge advocates." Thirty-six officers were in the Office of the Judge Advocate General in the War Department on this date, and the others were in the headquarters of the corps areas, overseas departments, and tactical divisions, or detailed upon special legal advisory work elsewhere. There were 657 officers in the Judge Advocate General's Department Reserve and 97 judge advocates in the National Guard. The department has no enlisted men.

Army judge advocates examine each record of trial by court martial and advise commanding generals concerning the legality and justice of the sentence and the action to be taken upon the record. The Judge Advocate General's Department is, in addition, concerned with thousands of legal questions which arise each year in the activities of the Army.

The Judge Advocate General is legal adviser to the Secretary of War, the Assistant Secretary of War, the Chief of Staff, and the chiefs of the arms, services, and bureaus of the War Department. He supervises the system of military justice, and in his office the records of all important military trials are reviewed. The Judge Advocate General also attends to the legal side of business, property, and financial operations which come under the Secretary of War, and to legal questions growing out of the status, relations, and activities of the members of the Army. He is also the custodian of most documents which show titles to lands under War Department control.

Among the many legal matters dealt with by the Office of the Judge Advocate General are those relating to the following: personnel, war plans, financial estimates, supplies and equipment, the War Department Law Library which is one of the largest legal libraries in the United States, publications, records, indexing, preparing digests, Army property, Army regulations, review of legislation, opinions upon records of trial by general courts martial, correspondence with reference to trials, opinions on points of law and procedure, clemency memoranda, habeas corpus proceedings, the Government's property rights in Army inventions, patents on inventions by members and employees of the Army, licenses under patents, suits brought in the Court of Claims involving alleged infringements of patents by the War Department, and other business matters concerning the War Department.

The department also deals with questions relating to claims by and against the United States as a result of War Department and Army activities. When such claims result in litigation, it assists the Department of Justice in its preparation for trial and is sometimes called upon to aid in preparing pleadings and briefs. The department also passes on the legality of all contracts requiring the approval of the Secretary of War or the Assistant Secretary of War and advises other members of the Army on the military contracts which they sign.

All legal questions concerning real estate under control of the War Department and the Army, questions concerning river and harbor work, bridges over navigable streams, and application of State laws on military reservations are handled by the Office of the Judge Advocate General. It also advises as to sales of real and personal property under control of the War Department and passes on the legal questions of flood control, and prepares reports on legislation relating to all these matters.

Each staff judge advocate at the headquarters of a corps area, department, division, or other command, is legal adviser to his commander. His duties correspond generally to those of the Judge Advocate General.

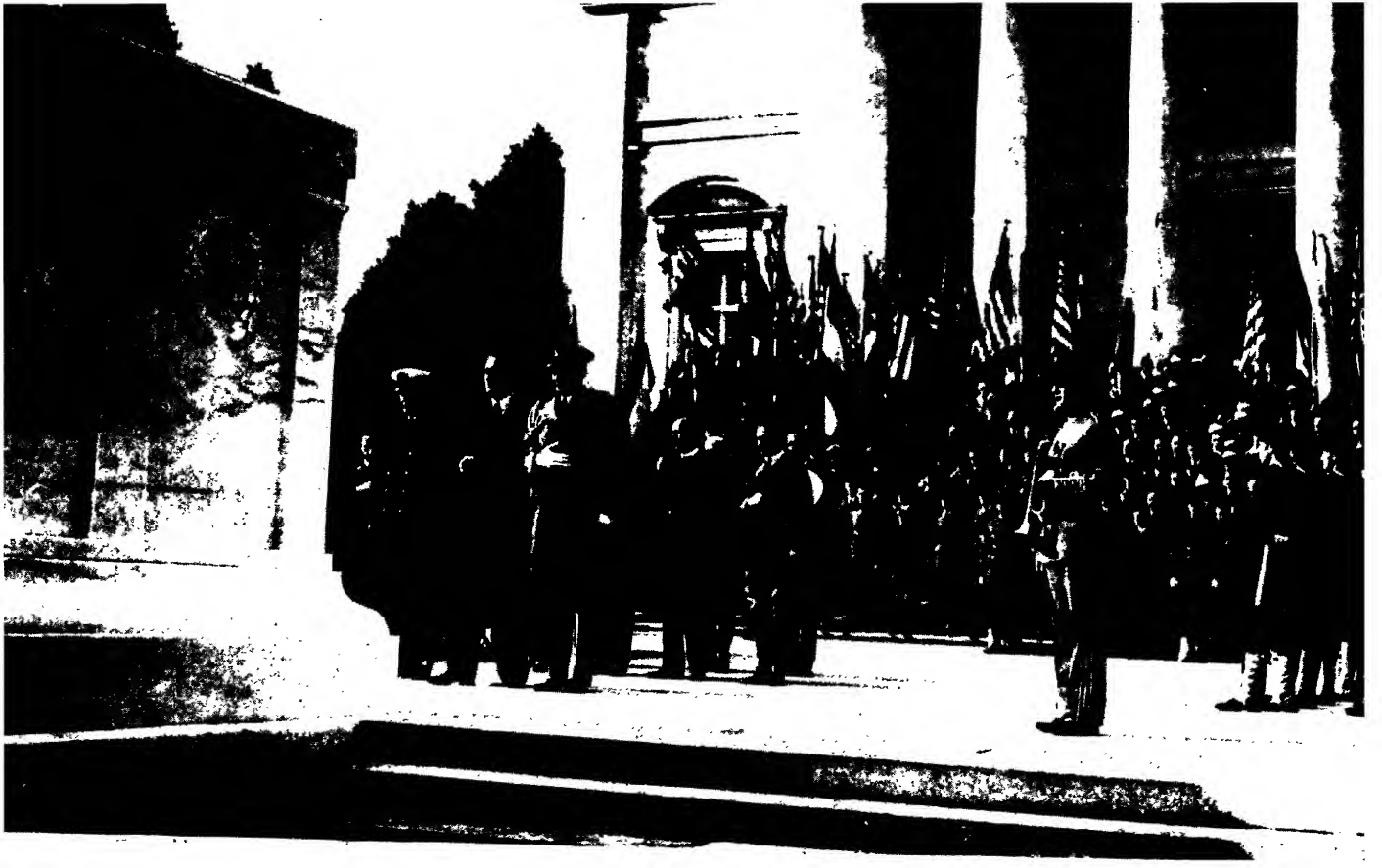
The Quartermaster Corps

The three fundamental personal needs of a soldier, as of any other person, are food, clothing, and shelter. The Quartermaster Corps obtains, stores, and distributes supplies, and builds and maintains permanent and temporary housing for all the arms and services. It does not, however, supply weapons and ammunition, and certain other special items.

The Quartermaster Corps also has charge of transporting the Army by rail and water. It operates all Army transports, which carry troops and supplies from the United States to our overseas stations. It provides and runs many of the other ships and boats used by the Army. The corps also operates the large installations of the Ports of Embarkation in Brooklyn, N. Y., and San Francisco, Calif., from which Army transports sail.

The Quartermaster Corps develops and obtains most of the motor vehicles used by the Army, except tanks and certain special heavy trucks which are obtained by the Ordnance Department. Some types of vehicles the Quartermaster Corps purchases direct from factories; others it manufactures in whole or in part. In peace and in war, this service repairs most of the trucks and cars of its own and other branches in the Regular Army and the similar vehicles of the National Guard. In war especially the truck and car companies of the Quartermaster Corps also furnish large numbers of vehicles to carry units of other arms and services when they must move rapidly and do not have enough vehicles of their own.

The Quartermaster Corps handles the purchase of land for new Army



posts or for the enlargement of posts that already exist. It has charge of constructing and repairing all Army barracks, quarters, and other buildings, and of building and constructing roads on Army posts and reservations. In war, however, road building and repairing is done largely by the Corps of Engineers. Other important Quartermaster Corps tasks are the installation, operation, and repair of Army utilities—heating plants, light plants, water and ice plants, and laundries.

Breeding stations and remount depots, which furnish the Army with mules and horses of fine types required for military purposes, are maintained by the Quartermaster Corps. The corps also operates the trains of pack animals in some of our tropical Army stations, used for carrying supplies in jungle regions where trucks or wagons cannot travel.

Supplying the needs of the soldier during his life, the Quartermaster Corps is also charged with all arrangements for his burial and for the maintenance of all cemeteries at Army posts and of 82 of the 93 national cemeteries, the others being maintained by the Department of the Interior. These 82 national cemeteries in as many different localities vary in size from small burial grounds of a single acre to Arlington Cemetery near Washington, D. C., with 400 acres. The total area cared for is 2,647 acres containing about 380,000 graves.

In beautiful Arlington National Cemetery in Virginia, across the Potomac River from Washington, is the Tomb of America's Unknown Soldier. In 1921, the Secretary of War delegated to the Quartermaster Corps the duty of selecting the Unknown Soldier. The Quartermaster General directed the Chief of the American Graves Registration Service in France to select from among the graves of our unknown dead the bodies of four who fell in combat. One was chosen from the American cemetery at each of the following battlefields: Aisne-Marne, Meuse-Argonne, Somme, and St. Mihiel.

At a ceremony held at the Hotel de Ville in Châlons, an American Army sergeant of especially meritorious combat service, in the presence of the Quartermaster General, and other distinguished representatives of France and the United States, chose the Unknown Soldier. The body was brought to America and interred on Armistice Day, 1921, with fitting ceremonies, during which high military, naval, and diplomatic officials of Belgium, Great Britain, France, Italy, Rumania, Czechoslovakia, and Poland, as representatives of the governments and peoples of those nations, conferred upon the Unknown Soldier the highest military decorations of their lands.

The Tomb of the Unknown Soldier is now the scene of impressive annual ceremonies on Armistice Day, and at other appropriate times.

The chief of the Quartermaster Corps is the Quartermaster General who

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The President at a ceremony at the Tomb of the Unknown Soldier.

has the rank of major general. There are three Assistant Quartermasters General with the rank of brigadier general. All are in the Office of the Quartermaster General in Washington, where a number of other officers and a large force of civilian employees assist in supervising the work of the Quartermaster Corps.

The strength of the Quartermaster Corps on June 30, 1939, was as follows:

	Officers	*Enlisted men*
Regular Army	608	10,437
National Guard	673	5,191
Reserves	5,898	11

The Regular Army Quartermaster troops are distributed at practically every post of the Army, both in the United States and overseas. About half of the corps is contained in quartermaster units organized as quartermaster battalions, and as truck, maintenance, bakery, and park (garage) battalions and companies. In the National Guard there are 18 quartermaster regiments, one in each of the Guard infantry divisions and smaller quartermaster units in the cavalry divisions.

In each infantry and cavalry division of our Army in time of war, there is a large quartermaster unit which secures, transports, and furnishes to the fighting units all their essential supplies except arms and artillery ammunition. It contains truck and car companies, and a maintenance company for motor repair and replacement. It also has personnel to handle certain necessary supplies, and trucks that transport a reserve supply of gasoline and oil.

There are two main ways in which the Quartermaster Corps obtains supplies for the Army. It purchases foods and articles of standard manufacture direct from commercial dealers and manufacturers. Other articles are manufactured to better advantage in Quartermaster depots,

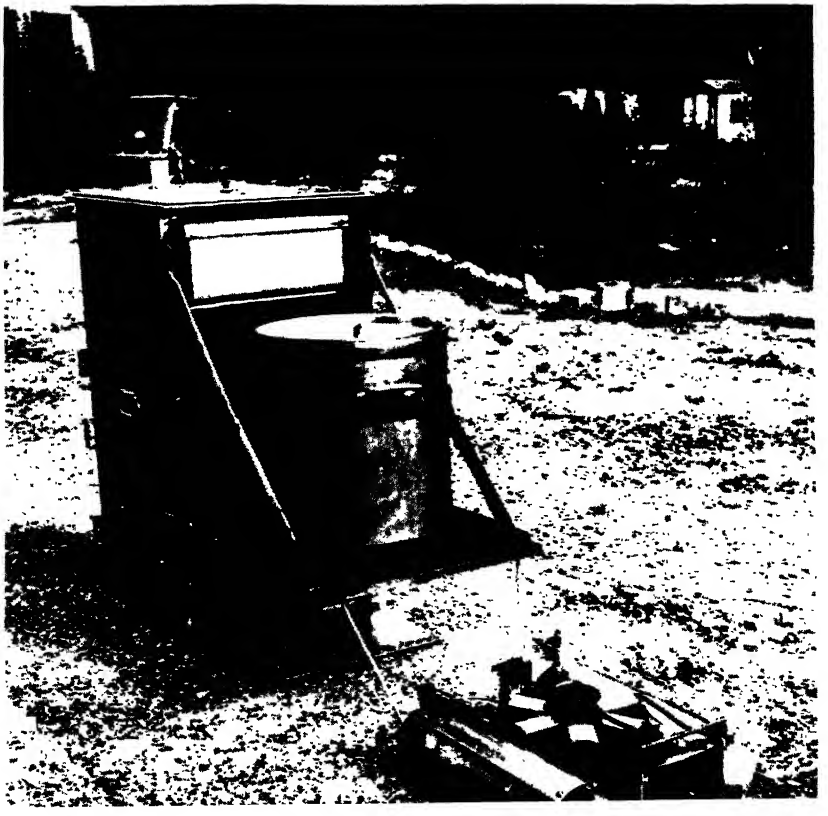
Interior of barracks.

but raw materials for these articles are bought in commercial markets and stored in Army warehouses.

The well varied food that makes up the "ration" of the soldier (the food for one man for one day) is of a high grade. His daily meals are well balanced and prepared, and contain all the vitamins and calories necessary to good health. About 60 percent of the food used by the Army, mainly staples, is purchased in large lots by Quartermaster depots and distributed to the Army posts from these depots. The other 40 percent of the food, including fresh meats, eggs, milk, and vegetables, is bought on contracts made locally by the Quartermaster purchasing officers at each Army post. Fresh bread is furnished by the bakeries at each post which also make certain kinds of pastry. Pies and cakes, however, are usually made by the cooks of the Army in their unit kitchens.

The money value of the Army ration is determined for each post by finding at the beginning of each month the actual cost at that post of the many foods in the ration. The cost for the whole Army is determined from the

Field kitchen designed and tested by Quartermaster Corps.



average cost in all corps areas and departments. The average cost of the Army ration during 1939 was 41.72 cents per day.

In addition to its military tasks, the Quartermaster Corps has, at times, certain nonmilitary activities. When the Civilian Conservation Corps was established, the Quartermaster Corps received the task of transporting the CCC enrollees to their camps, housing and feeding them while waiting to go to camps, and obtaining and distributing supplies of all kinds including trucks for work purposes, and carrying out many other duties for the CCC. In times of great disasters, also—floods, storms, fires, and earthquakes—when the War Department helps in the work of relief, the Quartermaster Corps furnishes food, tentage, blankets, cots, clothing, cooking utensils, forage, and many other things that are needed, and provides transportation to get these supplies to the stricken areas. (A later chapter describes the Army's work in times of disaster more fully.)

The Finance Department

The Finance Department is charged with disbursing and accounting for the funds appropriated by Congress for the Army. It pays the salaries of all War Department personnel, military and civilian, and pays the amounts due for all Army purchases. The Finance Department also has the important duty of auditing the accounts of Army property (arms, equipment, clothing, trucks, animals, etc.) kept by the other arms and services. Whether the Quartermaster Corps buys shoestrings or the Air Corps buys huge bombers, the Finance Department makes the payment, insures that the cost is charged against the right congressional appropriation, and sees that all items bought are correctly recorded in a property account and thus placed in the keeping of an accountable officer.

The Finance Department, on June 30, 1939, including officers temporarily detailed to it, consisted of 129 commissioned officers, 50 warrant officers and 478 enlisted men, under the direction of the Chief of Finance. This personnel was stationed in 90 finance offices in the United States, overseas Army posts, in the Office of the Chief of Finance in Washington, and in corps area and department headquarters. In addition to this Regular Army personnel, there were, on this date, 794 Finance Department Reserve officers and 47 in the National Guard. These officers are not on active duty with the Finance Department in time of peace.

The location of the finance offices and the system under which the Finance Department operates make it possible for all money that the Army owes to be paid promptly. In each finance office there is a disbursing officer who has under his control at all times enough Government funds to make the payments required at his post. These funds are obtained for him by the Chief of Finance, who draws a "requisition" on the Treasury of the United

Noncommissioned officer's quarters, Fort Knox, Ky.

States for the amounts needed. The Treasurer of the United States then places the amount to the credit of the finance officer, who can then write checks or draw out cash to make payments.

There are large disbursing offices in the main commercial centers of the country, such as Boston, Brooklyn, Chicago, and San Francisco, to make payments for purchases of supplies in large quantities. There are disbursing offices at most Army posts to pay for local purchases of supplies and to pay the troops. Each soldier is paid monthly.

The Finance Department disbursing officers also pay to members of the National Guard their armory drill pay. The United States property and disbursing officers in each State, who disburse National Guard field training pay, and other funds appropriated by Congress for the National Guard, are not disbursing officers of the Finance Department but are Federal disbursing employees, who are officers of the National Guard, and may hold commissions in the Finance Department of the Army of the United States, although this is not required.

Commercial bills are paid promptly to take advantage of cash discounts. From 1919 to 1939, the total thus saved amounted to $11,413,113.58. Prompt payments make further savings by keeping the Army a "good customer" so that business men quote lower prices on supplies than if there were delays in payment.

Disbursements for military purposes made by officers of the Finance Department amount to over $400,000,000 each year. When it is considered that every disbursing officer is held personally accountable for every dollar entrusted to him, it can readily be seen that extreme care is taken in safeguarding funds and in making only payments that are correct and authorized.

The property accounts for all items of property purchased for the Army from funds appropriated by Congress are audited by the Finance Department. These include such big items as army transports, real estate, buildings, docks, piers, and machinery, as well as supplies and materials bought and issued out to clothe, feed, and equip the troops for service in peace and war. The value of this property, not including the value of grounds and buildings, is over two billion dollars. In case of shortages or of damage to property, the Chief of Finance makes recommendation to the Secretary of War as to what person, if anyone, is responsible for the loss. Similarly, he makes recommendations as to the liability of the Government in connection with claims for damage to private property.

The Chief of Finance is also the Budget Officer for the War Department and as such prepares the advance estimates of the Department. Another Finance Department service is the payment of insurance premiums direct to insurance companies and to the Veterans' Administration in amounts authorized by officers and enlisted men to be deducted from their pay. It also pays money allotted to their dependents by members of the Army. This service is helpful in peacetime and invaluable in time of war.

The Finance Department disburses certain funds for nonmilitary activities of the War Department contained in the annual civil appropriation acts, and the Chief of Finance, as Budget Officer, prepares the estimates for these appropriations. The Finance Department is also called upon from time to time to disburse funds allotted or appropriated for such purposes as relief for flood sufferers, the pilgrimage of Gold Star Mothers to France, and the 1938 assemblage of Civil War Veterans at Gettysburg, Pa. In addition, the Chief of Finance acts as fiscal agent for the Civilian Conservation Corps, and in this capacity disbursed $2,200,863,270.35 between 1933 and 1939.

Northrop *A–17* attack airplanes.

Preparing vaccine for Army use.

The Medical Department

The Medical Department is the service of the Army that maintains its health, treats its sick, and heals its wounded. Through physical examinations the Medical Department selects for admission to the Army of the United States only those who are in good physical condition. It keeps the members of the Army in good physical shape through periodic examinations made for the purpose of discovering all defects early, so that prompt steps can be taken to remedy them and so that the Army's fitness for national defense can always be kept at a high level.

Preparing vaccine against horse sleeping sickness.

Every activity of the soldier in every hour of every day, in peace and in war, is of concern to the Medical Department in its task of keeping the soldier in good health. Army medical officers watch to see that the soldier's surroundings are as healthful as the conditions under which he must perform his duties will permit, and make frequent inspections for that purpose. They advise all commanders of suitable measures to preserve health and prevent and control disease.

The Medical Department gives advice on the clothing the soldier wears, the food he eats, the water he drinks, the places where he camps, the barracks in which he lives, the hours and conditions under which he works, and also on the control of disease-bearing insects and other sanitary measures.

The continuous service of the Medical Department is given to the Regular Army through a series of medical installations ranging from the unit dispensary where mild cases are treated to the large general hospitals at which serious cases are diagnosed and treated. In time of peace the soldier is treated in permanent hospitals conveniently located to his place of duty. In war, mobile medical units do their work on and near the battlefield to bring back the wounded, give them treatment in aid stations and mobile hospitals, and move them to general hospitals in the rear.

Preparing typhoid vaccine for Army use.

The Medical Department consists of the Surgeon General with the rank of major general, four Assistant Surgeon Generals with the rank of brigadier general, one of whom is from the Dental Corps, five separate corps of officers, the enlisted men, and a number of civilian employees. The Surgeon General is the medical adviser to the Secretary of War and the Chief of Staff.

The strength of the Regular Army Medical Department, on June 30, 1939, was as follows:

Corps	*Officers*	*Enlisted men*
Medical Corps	1,098	
Dental Corps	221	9,052
Veterinary Corps	126	
Medical Administrative Corps	64	.....
Army Nurse Corps	672	.....

The Medical Department strength in all components was:

	Officers	*Enlisted men*
Regular Army	1,509	9,052
National Guard	1,537	12,211
Organized Reserves	24,093	16

In the National Guard and Organized Reserves the strength is distributed among the Medical, Dental, Veterinary, and Medical Administrative

Corps; and in the Reserve there are also 432 members of the Sanitary Corps, which is not found in the other two components.

The Medical Corps gives about 7,500,000 treatments and cares for about 270,000 patients in hospitals during each year in time of peace. The patients include not only members of the Army, but also Veterans' Administration and Civilian Conservation Corps patients. Officers of this service also have many duties other than those which are purely professional. Medical supply, sanitation, command of hospitals, command of mobile medical units, and instruction in the service schools of the Medical Department and other arms and services are the more important of these duties. The Dental Corps gives dental care to the Army, and makes periodic inspections to discover need for dental treatment. Over 250,000 treatments are given each year. The Veterinary Corps takes care of military animals and makes inspections of food and forage used by the Army. Officers of this corps command the veterinary units of the Army in peace and war. The officers of the Medical Administrative Corps help in conducting the work of the Medical Department at the larger hospitals and headquarters.

The Army Nurse Corps gives assistance in the care of sick and wounded. The members of the Army Nurse Corps have relative rank from second lieutenant to major, and are on duty at about 40 different general and post hospitals in the United States and at overseas stations. In time of war many additional nurses are obtained through the American Red Cross.

The duties of the enlisted men of the Medical Department are varied and technical, ranging from those of ambulance drivers to those of skilled assistants in laboratory, X-ray, dental, and surgical work.

The Medical Department maintains seven completely equipped and fully staffed general hospitals, and hospitals of a smaller size at most Army posts. There are five active medical battalions assigned to infantry divisions of the Army, and two partly active medical squadrons with cavalry divisions.

Medical equipment and supplies for the Army are obtained, stored, and issued from medical supply depots operated by the Medical Department. The Medical Department devises and tests equipment to assist in the care of patients, such as first-aid packets, litters, ambulances, and motorized field equipment and surgical operating facilities. Vaccines for the prevention and treatment of certain diseases, and other laboratory products, are prepared in the laboratories of the Army Medical School in Washington.

The Army Medical Library in Washington, operated by the Medical Department of the Army, is the largest medical library in the world. It has about 1,000,000 books and manuscripts. The Army Medical Museum, housed with the library, now contains the largest collection of medical specimens in the United States and is constantly visited by doctors and students engaged in research.

Enlisted dental technicians' class at Army Medical Center.

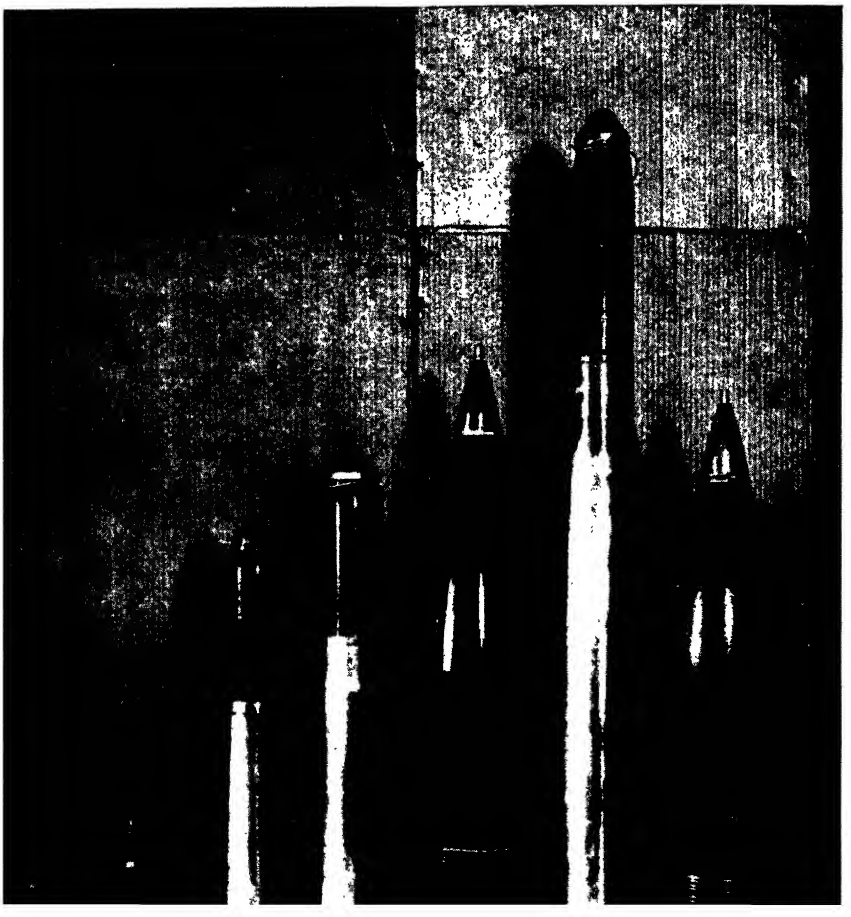
The Army's medical officers have been leaders in discovering and applying sanitary measures to prevent and control disease. The discovery of how yellow fever is carried, the control of mosquito-borne diseases in Cuba and Panama, and the practical extinction of typhoid fever in our Army through inoculations and better sanitation, are examples of this work. The results of this battle with disease were demonstrated in the World War. Smallpox claimed over 7,000 soldier victims during the Civil War and 272 during the Spanish-American War and the Philippine Insurrection, but only 14 soldiers died from this disease during the World War with 4,000,000 men in service. Malaria claimed 15,000 during the Civil War; it took only 36 during the World War. In the Spanish-American War, 20,926 soldiers, or 12 percent of those under arms, suffered from typhoid fever. During the World War there were only 1,529 cases, or about one-twentieth of 1 percent of the total number of men under arms.

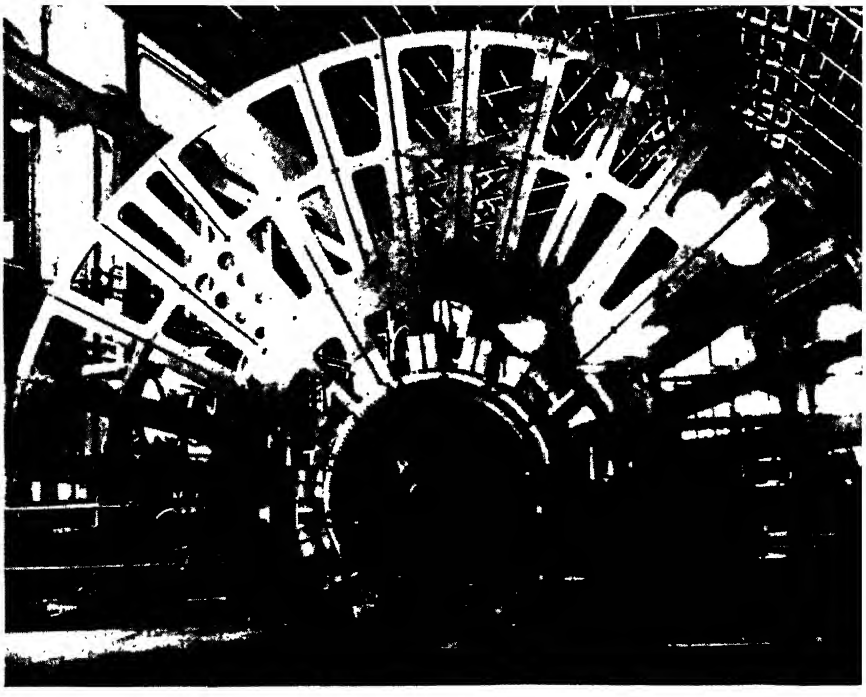
The Medical Department cooperates in civil affairs in a number of ways. It safeguards health in the Panama Canal Zone, where the chief health officer is a Regular Army medical officer on the staff of the Governor, and supervises the widespread sanitation and mosquito control necessary to make this tropical station safe for Canal employees and Army personnel. The Surgeon General of the Army is a member of the central committee

of the American Red Cross and advises that organization on the assistance it can give in time of war. The Medical Department furnishes medical personnel, units, and supplies to assist civil agencies in time of disaster, and cooperates with the Red Cross in such work.

The Medical Department furnishes a complete medical service for the Civilian Conservation Corps in addition to that for the Regular Army. It cared for about 256,000 admissions to sick report among members of the CCC during 1938, utilizing Regular medical personnel and some 1,400 Reserve officers of the Medical Department, and Army and other Government hospitals, and civil hospitals. It examines all enrollees, gives them protective inoculations against certain diseases, supervises sanitation to prevent disease, inspects food and water, furnishes necessary medical supplies, and cares for the sick and injured.

ht: cal. .30; cal. .50; 75-mm. howitzer and gun; 155-mm. howitzer; 3-in. antiaircraft; 155-mm. gun.



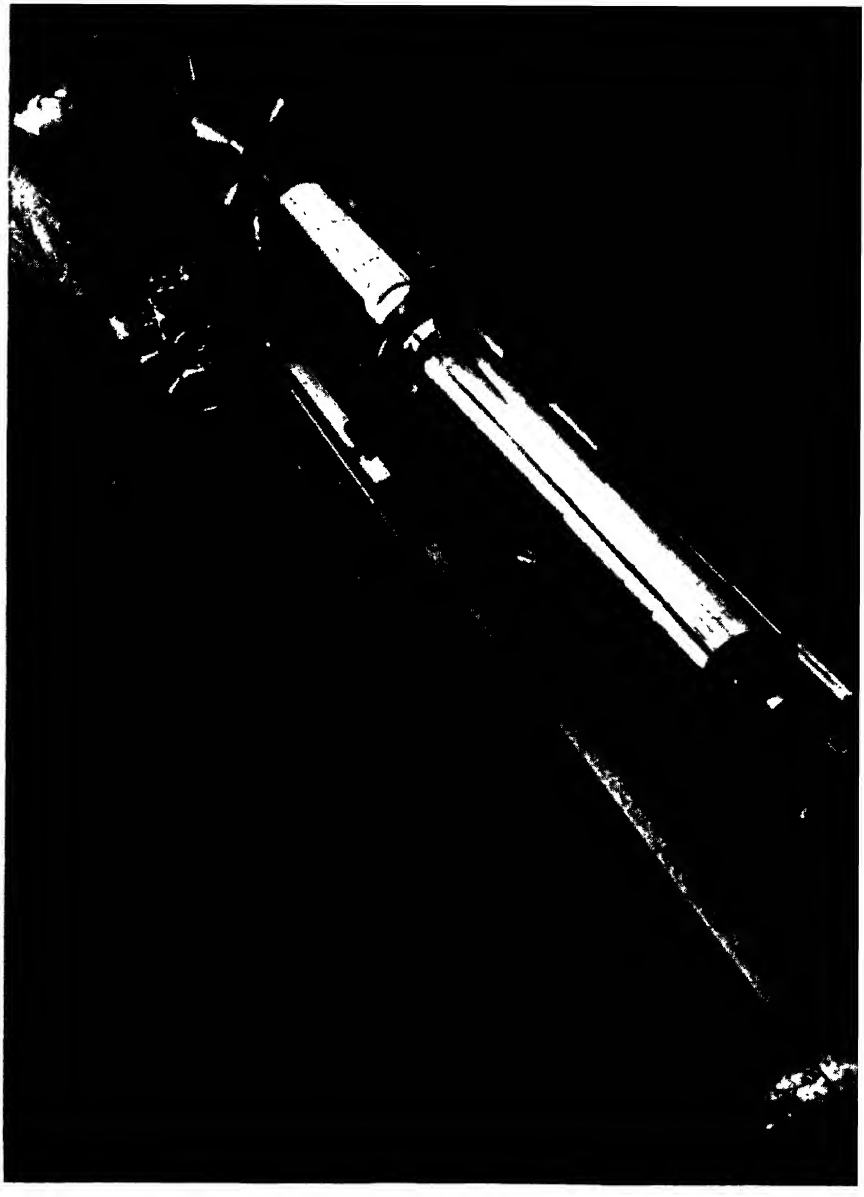


Ordnance gear-cutting machine for large cannon, Watertown Arsenal, Mass.

The Ordnance Department

In war our Army uses large numbers of weapons of all kinds from pistols to huge guns and tanks, and tremendous amounts of ammunition for all these tools of war. It is the business of the Ordnance Department to design, obtain, and distribute to the arms and services that use them the weapons and ammunition with which war is fought. The work of improving old weapons and developing new ones, which goes on constantly in time of peace as we prepare for the defense of our country, is another important work done by the Ordnance Department. It also takes care of the large stores of fighting materials kept on hand in peace and in war, and helps the other arms and services to take proper care of the weapons in their hands.

The list of weapons, ammunition, and other materials handled by the Ordnance Department contains more than 2,500 separate items, and these items have altogether more than 250,000 different parts. Some of the main items are: pistols, semiautomatic rifles, automatic rifles, machine guns (for troops, tanks, and airplanes), trench mortars, hand grenades, antiaircraft guns, antitank guns, cannons of all sizes, tanks, armored cars, scout cars, combat cars, instruments for controlling and directing the fire of weapons, ammunition, pyrotechnics for signalling purposes, and bombs.



Rough turning exterior of cannon in Ordnance shops, Watervliet Arsenal, N. Y.

Ordnance shop test of recoil mechanism, 3-inch antiaircraft gun, Rock Island Arsenal, Ill.

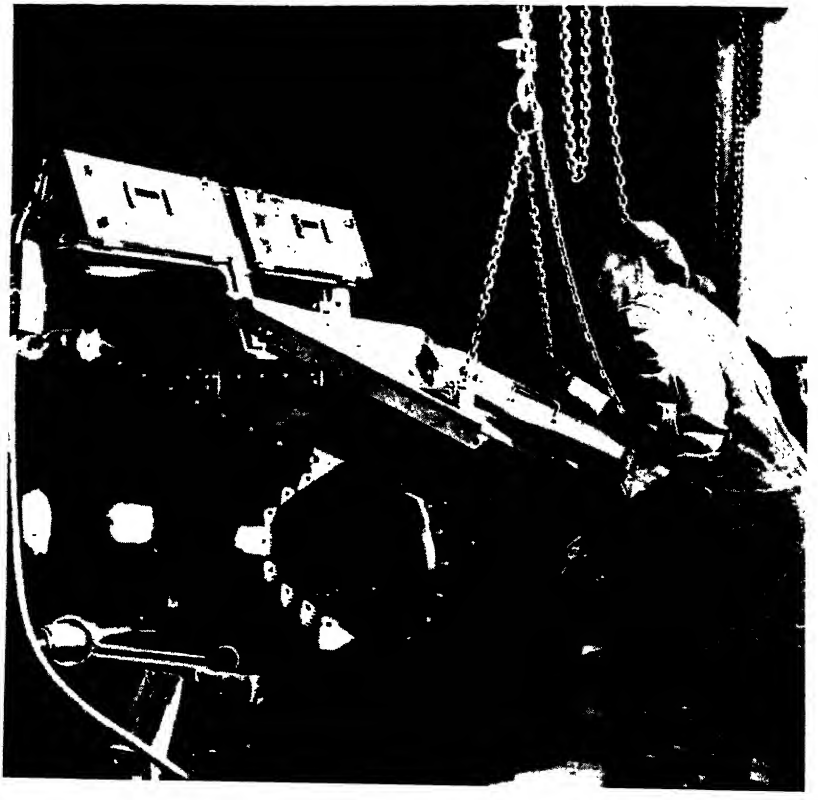
The Ordnance Department is headed by the Chief of Ordnance with the rank of major general and two Assistant Chiefs of Ordnance with the rank of brigadier general. The strength of the department, on June 30, 1939, was as follows:

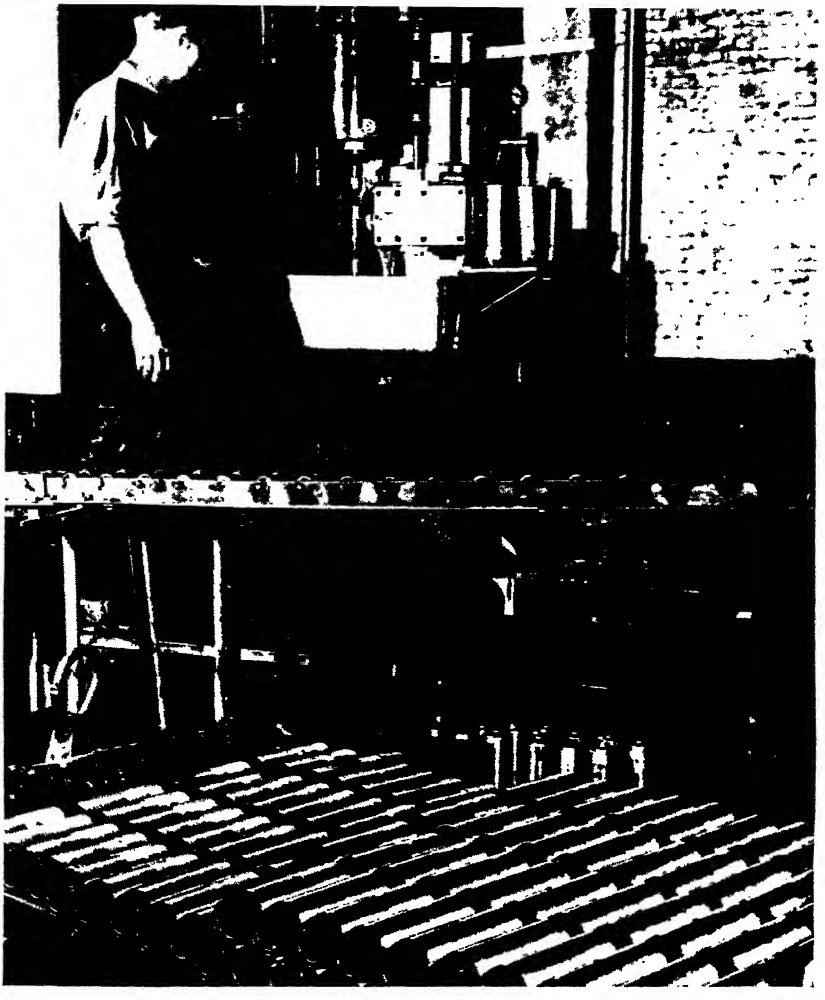
	Officers	*Enlisted men*
Regular Army	286	2,729
National Guard	86	507
Reserve Corps	3,029	.....

There is also a large corps of expert civilian employees, totaling nearly 14,000

There is ordnance personnel stationed at the general depots of the Army where supplies of all kinds are kept including ordnance materials, at the six manufacturing arsenals, at the testing or "proving" ground, and at 15 supply depots of the Ordnance Department. An ordnance service company is stationed at each corps areas headquarters and at the United States Military Academy. There are 31 ordnance companies at various Army posts including overseas stations. Ordnance service is also provided for the General Headquarters Air Force.

Fitting tank armor in Ordnance shops, Rock Island Arsenal, Ill.





Manufacturing shells, Frankford Arsenal, Pa.

The six manufacturing arsenals are: Watertown Arsenal at Watertown, Mass.; Picatinny Arsenal at Dover, N. J.; Watervliet Arsenal at Watervliet, N. Y.; Frankford Arsenal at Philadelphia, Pa.; Rock Island Arsenal at Rock Island, Ill.; and Springfield Armory, at Springfield, Mass. These arsenals make most of the Ordnance materials used by the Army in peace and can be considerably enlarged for war production, but it is estimated that they could supply only 10 percent of what we would need in a major war. The rest would have to come from commercial manufacturers.

Workman at drill press in Ordnance shops, Rock Island Arsenal, Ill.

Fitting tank track in Ordnance shops, Rock Island Arsenal, Ill.

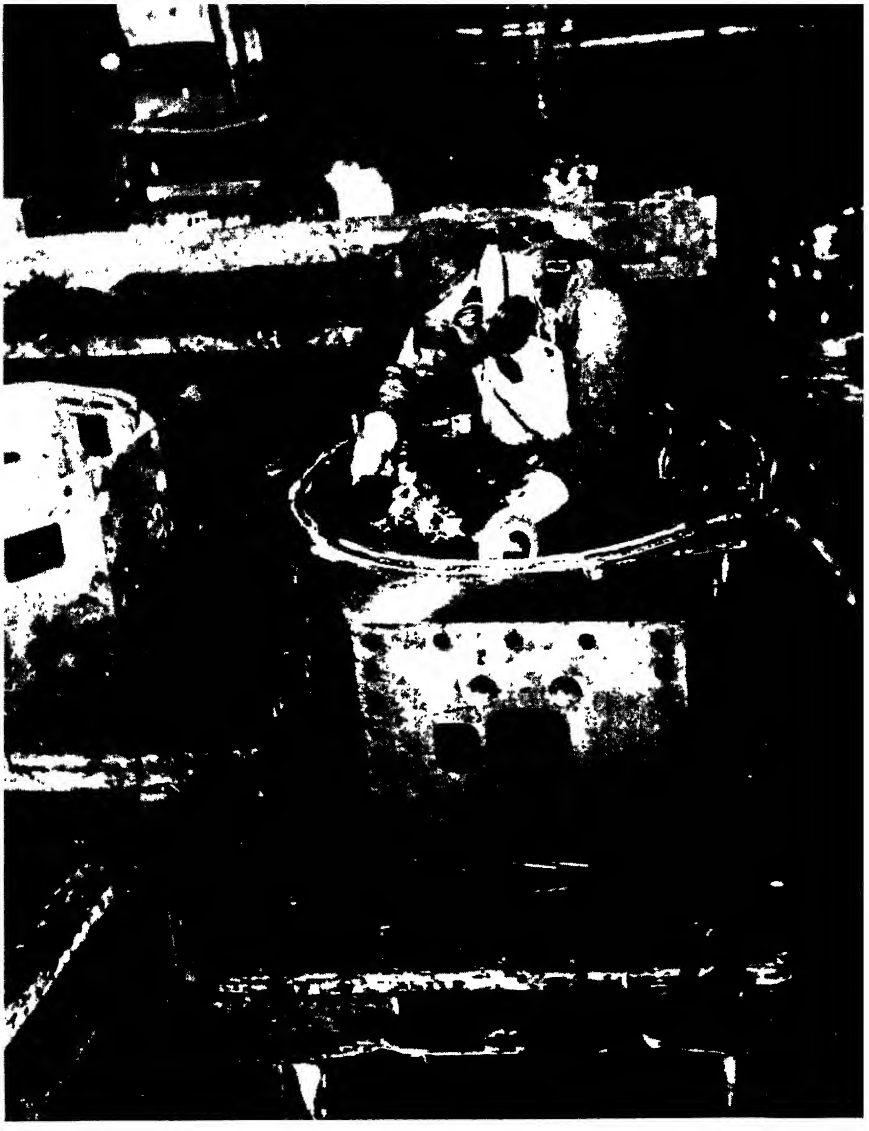
The Ordnance Department carries out its part of the Industrial Mobilization program through 14 "procurement districts." The headquarters of these districts are located in principal cities throughout the country. Each district is headed by a district chief, who is thoroughly familiar with the industrial capacity of his district. The total required war load, less what it is expected the arsenals will produce, is divided among the various districts. Through contacts with manufacturers and surveys of their plants,

Assembling turret on tank in Ordnance shops, Rock Island Arsenal, Ill.

each district plans for the production of each item of ordnance in the quantities it will need for war.

To determine the durability and accuracy of weapons, ammunitions, and other ordnance materials, tests are carried on by the Ordnance Department at the proving ground at Aberdeen, Md. Before any ordnance item is produced in quantity, a working model, known as a pilot, is made. At the proving ground these pilots are subjected, under close supervision, to severe tests in order to bring out defects under conditions like those in which the item will be used in actual service. In addition to these development tests, the proving ground conducts tests to determine whether manufactured ordnance materials are up to the standard set in the contracts let for such materials, thus safeguarding the army from possibly defective articles of armament.

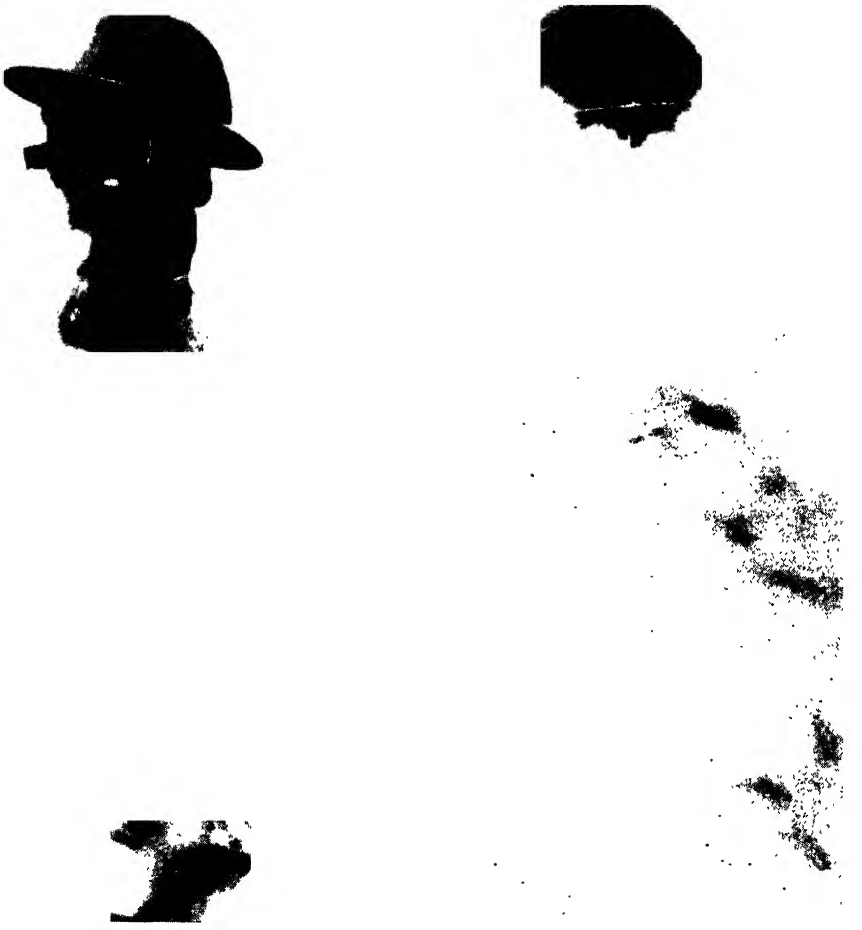
One of the most important changes in the Army's fighting equipment in recent years was the adoption of the semiautomatic rifle in 1936. This rifle, known as the "rifle, caliber .30, M1", is a self-loading weapon, which can be fired rapidly and for long periods without fatigue to the soldier. It has a fire power equivalent to approximately two and a half times that of the single-shot rifle. It is gas-operated and air-cooled, and weighs about 9 pounds. It fires clips containing 8 cartridges each. Two other vitally im-



Grinding tank turret after welding in Ordnance shops, Rock Island Arsenal, Ill.

portant developments have been the 37-mm antiaircraft weapon and the 37-mm antitank gun, both of much importance in modernizing our forces.

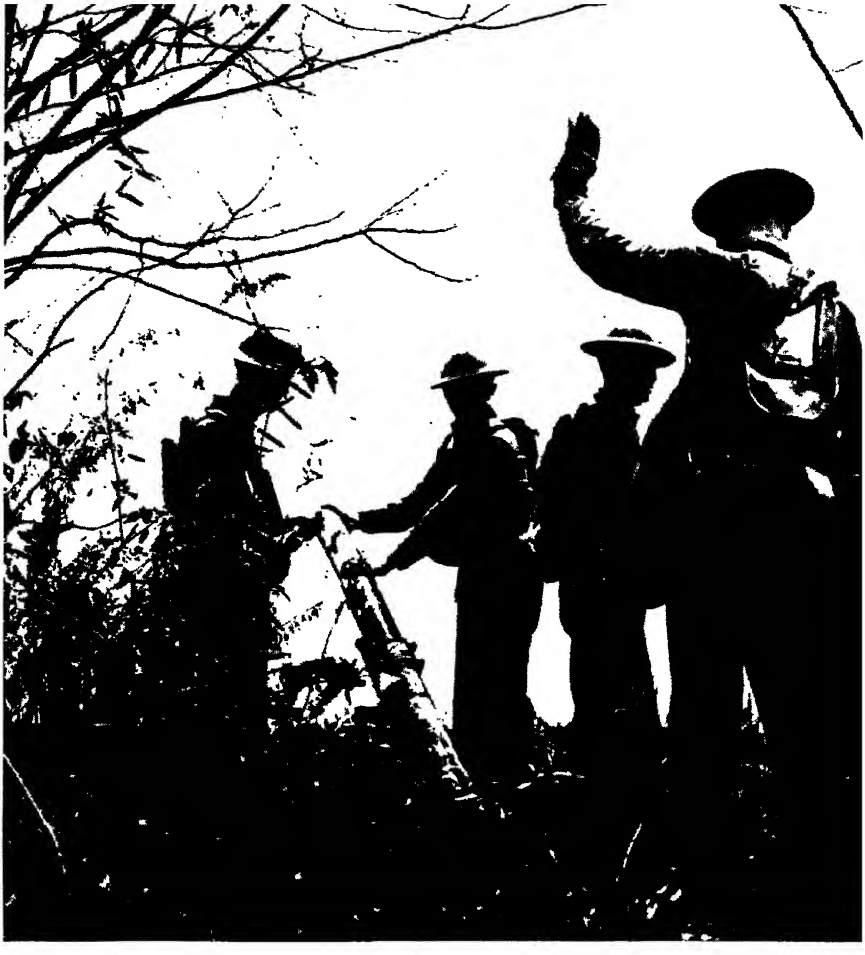
The Ordnance Department with its large force of technical experts, gives the Army the tools it fights with. In all its work, it cooperates closely with the fighting arms to furnish them the best and most powerful tools of war.



Gas-masked men in smoke.

The Chemical Warfare Service

Chemicals, gases, and smokes are a most powerful means of modern warfare. In the World War chemicals were responsible for one casualty in every four among our American troops. Our Army of today must have protection for all its arms and services against the chemicals an enemy may use. It must also have chemical weapons and units of its own to use in order to wage war on even terms if an enemy uses chemicals against us. The development and supply of smokes, gases, and incendiary materials, and of weapons from which to fire these chemicals; the training of special gas troops; and the protection of the whole Army against any enemy's



Firing Chemical Warfare Service 4.2-inch mortar.

chemicals—these are the important tasks of the Chemical Warfare Service.

In any war in which our Army uses chemicals, Chemical Warfare units take active part in battle. Like those of the Field Artillery, the weapons of the Chemical Warfare Service assist the Infantry, Cavalry, and other ground troops to advance against the enemy. They "neutralize" enemy positions with gas and burning materials, and cover the enemy with smoke so that he cannot see our troops to fire at them as they attack.

The principal weapons of chemical troops are the chemical mortar, the Livens projector, and the portable chemical cylinder. The mortar is a rifled weapon of 4-inch caliber, firing a 25-pound shell to a range of 2,400 yards. About one-third of the total weight of the shell is gas. It can fire

Soldier adjusting mask.

with high accuracy at a rate of 20 rounds per minute for short periods. These mortars are light enough to be carried by hand in several parts. Over long distances they are moved rapidly in light trucks which also carry the chemical troops themselves.

The Livens projector is a large weapon which cannot be readily moved but which is very simple and inexpensive. It fires a 60-pound shell (about half of this weight is chemicals) to a range of 1,450 yards. Large numbers of these projectors are emplaced in the ground and fired all at once to discharge a large quantity of gas against the enemy.

The portable chemical cylinder is a metal container which operates by means of gas pressure. It weighs about 55 pounds, of which more than half is chemical agent. These cylinders are set up in our own front lines and the gas then turned on. Thus they can only be used when the wind is in the right direction to blow the gas toward the enemy.

The strength of the Chemical Warfare Service, in the three components of the Army, was as follows on June 30, 1939:

	Officers	*Enlisted men*
Regular	98	803
National Guard	22	.....
Reserves	2,107	.....

There are also a number of civilian chemical specialists employed by the service. In addition, many officers of other arms and services receive special training in chemical uses and protection at the Chemical Warfare School, which is described in a later chapter. These officers are usually made "gas officers" and instruct the units of their own arms or services mainly in protection against chemicals. The National Guard Chemical Warfare Service officers are also special advisers to their commanders. Of the Reservists 1,120 are assigned to local duties by Corps Area commanders. Of the Regulars somewhat more than one-half are assigned to Chemical Warfare units, and the others are staff advisers to commanders of divisions and larger units.

The research and development center of the service is at Edgewood Arsenal, Md. Here, also, is the Chemical Warfare School, a storage depot, and a small unit of chemical troops. There are also small chemical warfare troop units at the Infantry School and in the overseas departments. Small detachments of troops are stationed at certain Army posts throughout the United States to assist in the training of all components of the Army. The Chemical Warfare Service conducts chemical warfare research for the Navy and maintains close contact with other Government departments.

Probably the most important single problem of the Chemical Warfare Service is the development of suitable protective equipment. This requires

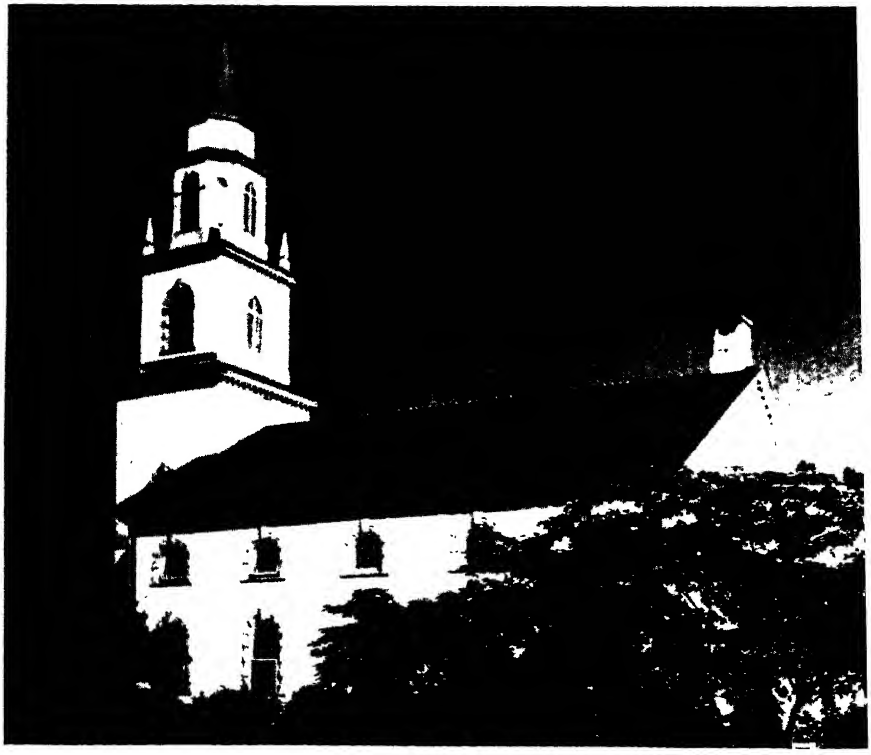
a knowledge of the characteristics, action, and effects of all chemicals that might be used against our Army. Suitable masks and other equipment must be designed to prevent or reduce these effects both on men and animals.

Many developments of the Chemical Warfare Service have been of value to industry; for example, the investigations made to find a chemical that could be included in illuminating gas so as to give warning of its presence and thus prevent accidents when gas leaks occurred. Results of this investigation were furnished by the Chemical Warfare Service to the United States Bureau of Mines which ultimately solved the problem. The Chemical Warfare Service was also called upon for assistance in finding a method of reducing the hazards of fumigating ships. At the time of the investigation, hydrocyanic acid gas was used in this operation. That gas is very deadly and not readily detectable by odor, even when there is enough of it present to kill a man. In cooperation with the Public Health Service, a method of fumigation by using cyanogen chloride together with hydrocyanic acid was developed. Cyanogen chloride is a tear gas and is readily detected in very small quantities. In the special gas mask used for protection against hydrocyanic acid gas, less protection is given against cyanogen chloride, and thus the tear gas penetrates the mask more readily and serves as a warning.

Improvements in the activated charcoal used in the Army gas mask to remove poisonous gas from inhaled air have also assisted industry. This charcoal is used in the recovery of gasoline from natural gas and for many other valuable purposes in various processes of modern industry.

The War Department is convinced that the best insurance against employment of chemical agents by an enemy is the knowledge that our Army is fully prepared to defend itself against the use of all types of chemical agents, and to retaliate promptly if they are used.

An attack airplane laying a smoke screen.



Post chapel, Fort Benning, Ga.

The Corps of Chaplains

The Corps of Chaplains is specially charged with the religious and moral welfare of members of all arms and services. In addition to the Chief of Chaplains, who has the rank of colonel, this service had, on June 30, 1939, 124 Regular Army officers of the grades from first lieutenant to colonel, and 1,057 Reserve Chaplains and 234 National Guard Chaplains. This corps has no enlisted men.

The Chief of Chaplains has general supervision over the chaplains and advises the Secretary of War and the Chief of Staff on religious and moral matters. Each commander of a corps area or overseas department has a chaplain on his staff to supervise military religious activities in his area, including the extension course studies of Reserve chaplains. Other chaplains are on the staffs of the commanders of Army posts and large Army units. In war, each regiment, brigade, and larger unit has its own chaplain.

A chaplain is the adviser and consultant of his commander in all matters of public religious observance, and in matters involving morale, morality, and character building. He is usually the librarian of the post he serves,

and he often carries on a program of vocational guidance, particularly among the newly enlisted men. When time permits, he assists in welfare and recreational activities. When he is stationed with a large command, or at posts where summer training camps are held, he supervises the training of Reserve chaplains called to active duty for a 2 weeks' period. The chaplain in the Army is like the pastor in civil life except for the fact that in the Army he provides for the spiritual welfare of the entire command, and not merely of one particular group or denomination. This he does, either through his own personal services or through the cooperative efforts of representatives of other faiths than his own. His duties are therefore most broad, and his position is unique in that he holds a dual commission—one from his own denomination and another from the Army.

Chaplains are selected from the various religious denominations for duty with the Regular Army in proportion to the number of members of each of those denominations in the Army as a whole. They must be college and theological seminary graduates with at least 3 years of practical experience in parish work, and they are certified to the War Department by their respective denominations as suitable for commission. National Guard chaplains are appointed by State authorities and hold Federal commissions also. Chaplains wear the regulation uniform, without arms, and they hold rank as officers of the various Army grades from first lieutenant to colonel.

Immediately after the Civilian Conservation Corps was established, the Chaplains Corps was asked to supervise and aid in religious ministration to enrollees. Reserve chaplains were called to active duty in the ratio of 1 to each 8 CCC companies. As CCC chaplains, they supervise the religious activities of the enrollees at camps assisted by local clergymen who volunteer to hold services, and also by contract clergymen. All faiths are accorded every service possible.

Through the courtesy of various civilian organizations and without expense to the Government, thousands of copies of the New Testament have been distributed to CCC enrollees. Complete Bibles have also been distributed in large numbers, one being furnished for each camp library and others to various chaplains for use in Bible classes. In addition to these books, thousands of tracts have been furnished to chaplains requesting them.

In peace and in war, the Corps of Chaplains ministers to the spiritual needs of the Army of the United States. In all the wars of our past history, since the beginning of our nation, chaplains have accompanied our troops through hardship and campaign, and on the field of battle. The chaplain goes where the soldier goes, and gives him spiritual help and inspiration.

During the fiscal year ending June 30, 1939, Regular Army chaplains conducted 22,656 services on Army posts attended by 1,706,820 persons.

Officer students working on map problem.

CHAPTER IV

THE ARMY'S SYSTEM OF EDUCATION

MODERN warfare is highly complicated. It also changes constantly as new developments in science bring new methods of war. Much study is required of a young man before he can gain a commission in our Army as a second lieutenant. But then, no matter how well he has studied to become an officer, his education has only begun. Rapid changes in ways of waging war, and the greater responsibility that comes to him as his rank increases—both of these are among the main reasons for the extensive system of military education that exists within the Army itself. Every few years an officer must become, for a period varying from a few weeks to a year (2 years in some cases) a "student officer" at one of the Army's schools.

An officer's earliest military training, before entering the Army, may be gained in a high school with a junior Reserve Officers' Training Corps unit, or at a private military school. His military education may then continue, either at West Point or in a senior R.O.T.C. unit in college, or perhaps at the Army's training center for flying cadets, or at a medical school.

If he is commissioned in the Regular Army, he serves a few years with troop units and then attends the "special service school" of his branch for a year. A few officers, having completed their own branch schools, are sent to take courses at other Army schools or at American or foreign universities.

At the end of some 12 or 15 years, officers who have kept up a high standard of efficiency become eligible for the Command and General Staff School at Fort Leavenworth, Kans., or at the Army Industrial College in Washington. Of those who complete either of these courses, about half attend a few years later the Army War College in Washington. This may be 20 years after the officer received his first commission. On completing the War College, he has now been through the whole series of Army schools, except that later on he may go to one or more of the special service schools for a month's "refresher" course to learn the latest branch developments, or may attend the Naval War College or a foreign military school.

If a young man becomes an officer in the National Guard or the Officers' Reserve Corps instead of the Regular Army, his military education likewise continues on for many years. Indeed, his promotion depends to a great extent upon his educational accomplishments. Before he is qualified for a higher rank, a Reserve officer must complete certain Army Extension Courses. These are correspondence courses prepared at the Army schools mainly to enable Guardsmen and Reservists to increase their military knowledge. At the beginning of 1939 there were over 100,000 persons taking Army Extension Courses, though not all were in the Reserve Corps or National Guard. Many officers and enlisted men of the Regular Army are also enrolled in these courses as the following table shows:

Army Extension Course Students, March 30, 1939

	Officers	*Enlisted men*	*Total*
Regular Army	1,427	1,147	2,574
National Guard	13,153	19,218	32,371
Organized Reserves	60,729	891	61,620
Citizens' Military Training Corps	.....	.....	3,808
Civilians	.....	.....	5,275
Total students	75,309	21,256	105,648

Members of the National Guard and Officers' Reserve Corps, selected from among those who can spare the time from their civil occupations may also attend special courses at arm and service schools, normally for 3 months. In turn selected graduates of these courses may take a course of similar

Observation post for Field Artillery firing instruction.

length later on at the Command and General Staff School, or attend briefer courses at the Corps Area Staff Schools.

But the schools for officers by no means form the whole of the Army's educational system. There are many special schools for enlisted men. There are also schools of several kinds conducted on every Army post and in the National Guard and Organized Reserves for both officers and enlisted men.

In the periods between their attendance as student officers at one school or another, the officers of the Regular Army have much duty as instructors. Officers on duty with Regular troop units, of course, spend the greater part of their time in training instruction and are often detailed as instructors in post schools. But besides these normal duties of instruction, about one Regular officer in six is on full-time duty as an instructor either at one of the Army's many schools or with the National Guard or Organized Reserves. The table on page 140 shows the number of officers on such duties at the beginning of 1939.

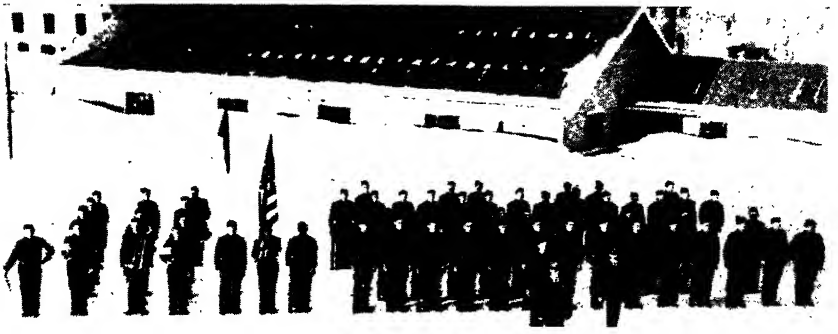
Purdue University R. O. T. C. Field Artillery unit firing salute.

Duty as an instructor is usually for a period of 4 years. Many officers on such duty also have charge of the work of extension course students in their localities. The instructors at the Command and General Staff School and the schools of the arms and services prepare the textbooks and lessons of the Army Extension Courses.

School or component	*Instructors*
Army War College	17
Naval War College	1
Command and General Staff School	81
Army Industrial College	8
Schools of the Arms and Services	729
United States Military Academy	250
National Guard	449
Organized Reserves	446
Reserve Officers' Training Corps	831
Total	2, 812

The rest of this chapter deals in greater detail with the different schools and types of instruction in the extensive and continuous system of military education covering all components of the Army of the United States.

The farthest north R. O. T. C. unit at the University of Alaska.



The Reserve Officers' Training Corps

The first direct contact of an American youth with the Army of the United States often comes through the Reserve Officers' Training Corps in high school or in college. The primary purpose of this corps, numbering 161,938 in 1939, is the development of Reserve officers who will take their places in the national defense in case of war. Thousands each year finish their training-corps work as they finish college, and accept commissions in the Officers' Reserve Corps. But becoming a member of the R.O.T.C. may also be the first step of a young man toward a life career in the Army. What he sees and learns of military things in the R.O.T.C. may turn his mind toward an appointment to West Point; or toward a Reserve commission first, followed by a year of active duty with its keen competition for a Regular commission under the Thomason Act; or toward striving, through the Air Corps Training Center in Texas, for appointment direct into the Regular Army as an Air Corps officer; or toward a commission in the Army's Medical Department.

The 162,000 members of the R.O.T.C. are to be found at 274 schools, colleges, and universities. Altogether there are 365 R.O.T.C. units, some of the larger universities having two or more units. There are two "divisions" of the R.O.T.C., senior and junior.

The 64,000 enrolled in the junior units are members of high schools and other secondary schools, and the 98,000 of the senior units are in colleges and universities which have 4-year courses and give degrees for academic work. In all these schools and colleges the R.O.T.C. military training forms one of the courses given to students. About 800 officers of the Regular Army and a large number of enlisted assistants, are on duty as R.O.T.C. instructors. There is work in the classroom, and lectures, as well as military drills. The junior division is made up entirely of Infantry. The senior division has units of Infantry, Cavalry, Field Artillery, Coast Artillery, Engineers, Medical Department, Signal Corps, Ordnance, and Chemical Warfare Service.

The junior division course consists of 3 years of training with 3 hours of work per week. This training covers much the same ground as the first 2 years of the senior division called the "basic course", which also comprises 3 hours of work per week. The basic course is required work in most colleges and universities that have R.O.T.C. units. The "advanced course", during the last 2 years of college, is an elective course at all but the purely military colleges. The advanced work requires 5 hours per week on military subjects.

On completing successfully the basic and advanced, or the junior and advanced courses, and attending a summer training camp for 6 weeks at

the end of his third college year, an R.O.T.C. member then receives his commission as a second lieutenant in his chosen arm or service. Thus he becomes a member of the Officers' Reserve Corps.

R.O.T.C. graduates composed about half of the Officers' Reserve Corps in 1939. As the Reserve officers who are World War veterans reach retirement age in greater numbers each year, others, commissioned from the R.O.T.C. steadily flow into the grade of second lieutenant and move upward in rank. Within a few years the Reserve Corps will be composed mainly of officers produced by the R.O.T.C.

Members of the R.O.T.C. receive a uniform from the Government which also supplies the equipment needed for their training. During the advanced course (the last 2 years of college), an R.O.T.C. member also receives the Army ration allowance, which amounts to about $100 per year. At the one summer camp he must attend, the Government furnishes him transportation to and from the camp, food, equipment, clothing, medical attention, and the pay of a private in the Army.

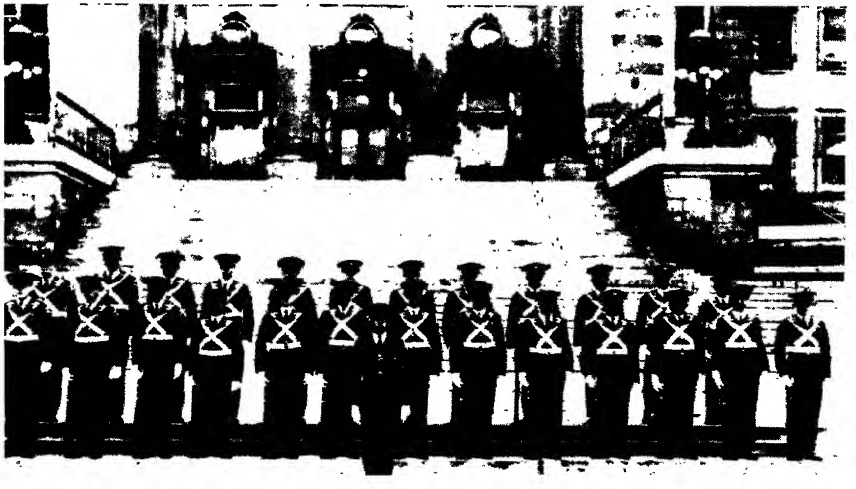
School Units Established Under Section 55c, National Defense Act

Similar to but not a part of the Reserve Officers' Training Corps are the units at certain schools and colleges which come under Section 55*c* of the National Defense Act and are called "Section 55*c* school units." The Government furnishes these schools with arms and equipment for training upon the request of the school authorities.

The course given is part of that prescribed for junior R.O.T.C. units. Whether this training is elective or required is decided by the school. Officers or enlisted men of the Regular Army may be assigned to these units as instructors, but in actual practice this is not often done.

On June 30, 1939, there were 36 of these units scattered throughout the United States, with about 10,000 students enrolled. Several thousand more take part in the training who are not regularly enrolled.

R. O. T. C. unit, Boise, Idaho, High School.



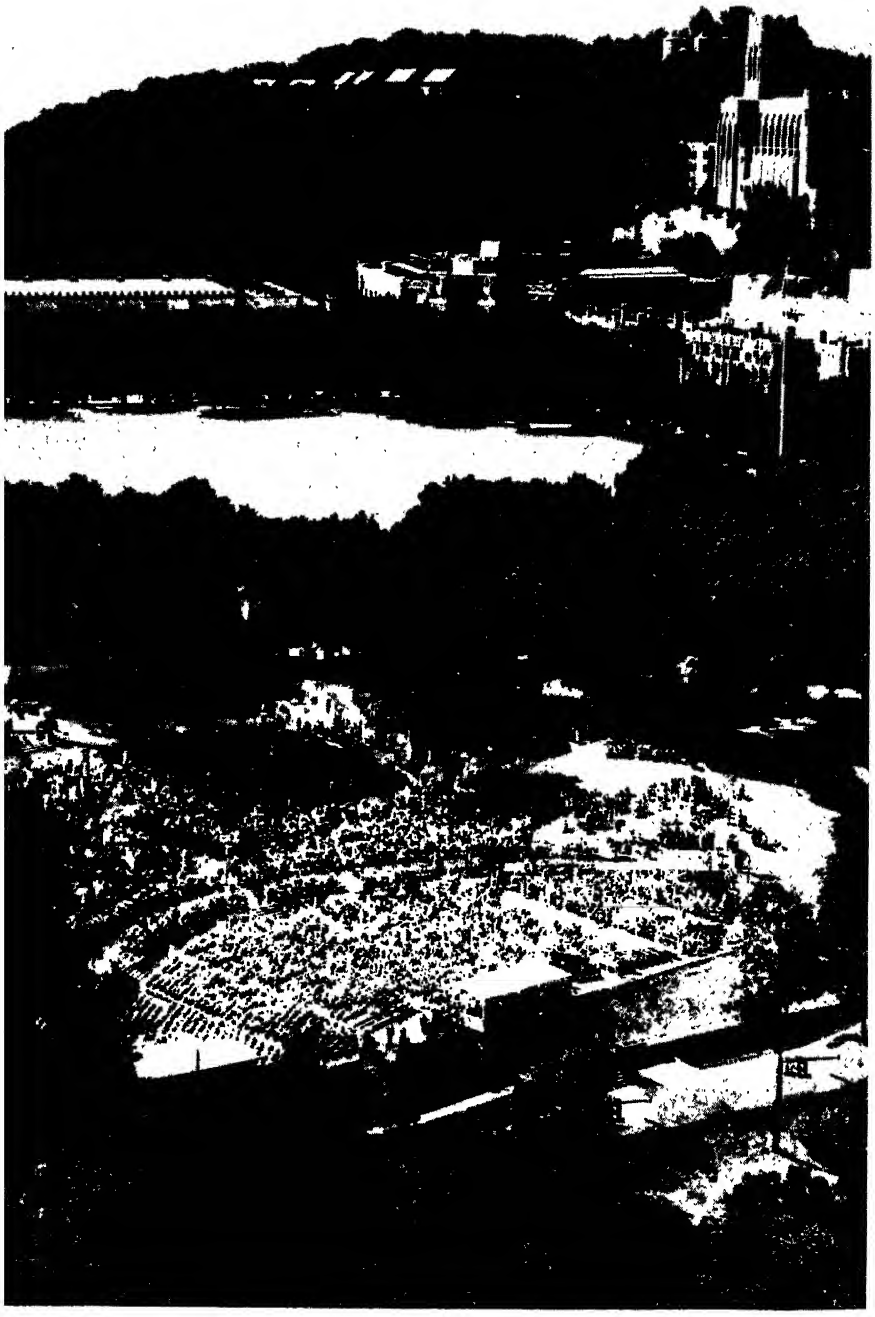
C. M. T. C. class observing fire.

Citizens' Military Training Camps

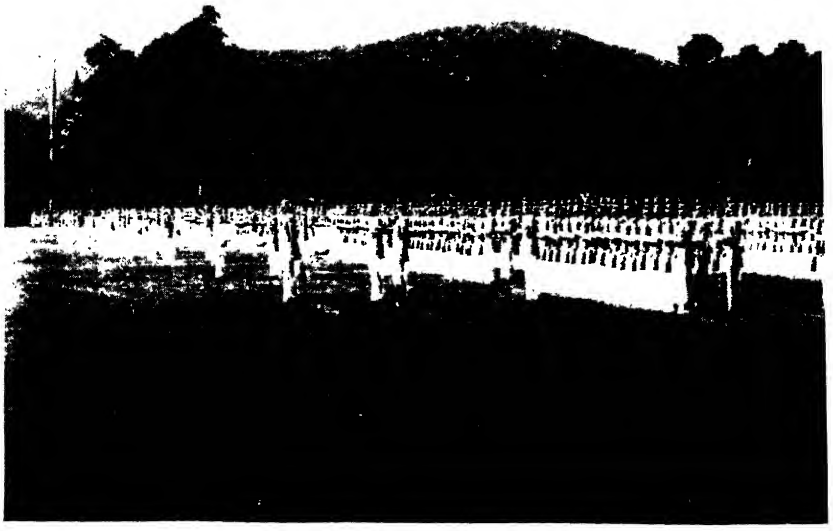
Another form of early military training which is also a way of gaining a Reserve Corps commission is afforded by the Citizens' Military Training Camps. These camps afford a chance for such training to young men who have no opportunity of receiving it in the R.O.T.C.

The complete C.M.T.C. course consists of four summer camps of one month each, held in successive years and called the "Basic," "Red," "White," and "Blue" camps. The course is attended by young men from civil life and includes training in leadership and other military fundamentals, and in citizenship. The training is progressive from year to year, and only those who are considered good material for Reserve officers are sent to the final Blue camp. Those who complete the four annual camps and pass other requirements including a full physical examination are then commissioned as second lieutenants in the Officers' Reserve Corps.

The C.M.T.C. member is furnished transportation to and from his camp by the Government, and he is fed, clothed, equipped, and given medical care during his attendance. He receives no pay. About 35,000 young men are trained annually, at camps all over the United States. A total of 343,000 had received this summer training up to June 30, 1939.



Graduation Day at the United States Military Academy.



Evening parade at U. S. Military Academy.

The United States Military Academy

The United States Military Academy at West Point is the chief source of commissioned officers for the Regular Army. The Military Academy is an institution established by the Government to train young men for military careers. Its students have the rank of "cadet" in the Regular Army. The Military Academy is under the direction and supervision of the Secretary of War. The head of the academy itself is the Superintendent, usually with rank of brigadier general, and in charge of cadets is the Commandant of Cadets, usually with the rank of lieutenant colonel. There are 282 officers of the Regular Army on duty at the academy. Of these, 58 are on the staff of the Superintendent; 22 are in the Tactical Department, headed by the Commandant of Cadets, the members of which are in command of the cadet units; and 202 are instructors in the Academic Department. There are 4 civilian instructors with the Department of Tactics and 3 with the Department of Modern Languages.

The authorized strength of the Corps of Cadets is 1,960. Cadets are appointed from sources as follows:

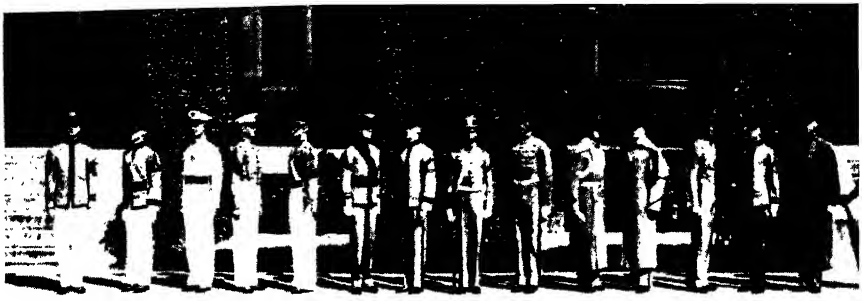
6 from each State at large	288
3 from each congressional district	1,305
3 from each Territory (Alaska and Hawaii)	6
5 from the District of Columbia	5
3 from Puerto Rico	3
1 from the Panama Canal Zone	1

Cadet room, U. S. Military Academy.

172	from the United States at large, as follows:	
	Appointed upon the recommendation of the Vice President	3
	Selected from among the honor graduates of those educational institutions designated as "Honor Military Schools"	40
	Chosen from among the sons of veterans, who were killed in action or died prior to July 2, 1921, of wounds received or disease contracted in line of duty during the World War	40
	Others from the United States at large	89
180	from among the enlisted men of the Regular Army and the National Guard, in number as nearly equal as practicable	180
	Total	1,960

In addition, the Secretary of War is authorized to permit not more than four Filipinos to be designated, one for each class, by the President of the Commonwealth of the Philippines, to receive instruction at the Military Academy. These cadets are eligible upon graduation to receive commissions in the Philippine Scouts. Also, not more than one citizen of any American Republic (South America, Central America, Cuba) may be designated to receive instruction at the same time at the United States Military Academy.

The selection of candidates from the States at large, from congressional districts, and from Territories, is entirely in the hands of the senators and representatives in Congress, and delegates to Congress. The selection may



Cadet uniforms, U. S. Military Academy.

be made by competition or otherwise. Candidates from "Honor Military Schools" are selected by those schools themselves. Candidates from the sons of deceased World War Veterans, the United States at Large, the Regular Army, and the National Guard, are selected by competitive examination.

To enter the Military Academy, a candidate must first obtain an appointment to an existing or prospective vacancy and must measure up to certain physical and educational standards. He must be a citizen of the United States, and must never have been married. He is eligible for admission from the day he is 17 (or 19, if he is from the Regular Army or National Guard), until the day he becomes 22 years of age. His physical fitness is determined by examination. His educational qualifications may be found by a mental examination, or partly by such an examination and partly by submitting acceptable certificates in proof of work done at other schools, or by certificate without any mental examination.

Upon reporting for admission, candidates must sign an engagement to serve in the Regular Army for 8 years unless sooner discharged. Before admission they must also take and subscribe to an oath of allegiance.

The course of study and training is of 4 years' duration. The academic year extends from September 1 to June 4. The greater part of the rest of the year is spent in camp and is devoted to military training.

New cadets report for duty at the Military Academy on the first week day in July. They are quartered separately from the Corps of Cadets and receive intensive infantry recruit instruction, and instruction in military courtesy, guard duty, and infantry weapons, and a course of corrective physical training.

After approximately 1 month, the new cadets then join the Corps of Cadets at the summer camp. The rest of the summer is devoted to a

continuation of elementary military training. At the end of this first summer, the first-year (Fourth Class) cadets become fully a part of the corps. The military training during the remainder of the year is basic instruction in infantry weapons and drill, map reading, musketry, rifle marksmanship, field artillery drill, riding, and instruction in customs of the service.

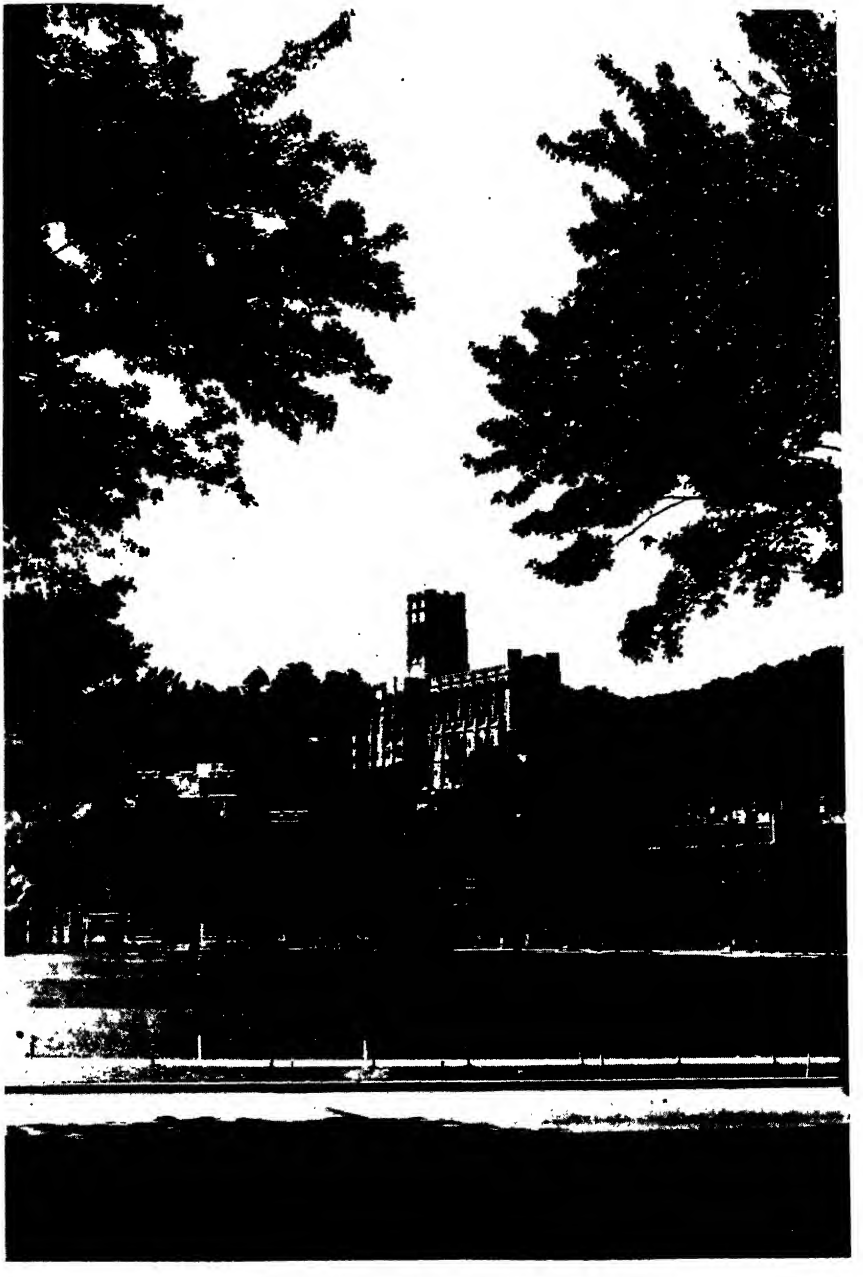
The military training for the Third Class during the second summer of a cadet consists of firing all infantry weapons including the rifle, the machine gun, the pistol, the 37-mm. gun, the automatic rifle, and the mortar. There is also instruction in the various types of field artillery and coast artillery guns; signal communications; in field exercises involving small infantry units in combat; and in riding and swimming. During the winter training period of the second year, instruction is continued in field artillery and coast artillery, infantry combat principles, riding, customs of the service, and close order infantry drill.

In the summer that begins his third year at the academy, a cadet goes on a leave of absence. The military work during the rest of this year prepares the class for its work in the fourth and last summer. It consists of learning how to fire coast artillery and field artillery guns; field artillery drill; riding; signal communication; and tactics of the small units of infantry, cavalry, field artillery, and coast artillery.

The military training of the cadet's last (First Class) year primarily develops leadership and command, and gives the cadet a general knowledge of the capabilities and limitations of the various arms in combat. During the summer, the cadets take part in field exercises involving infantry, engineers, cavalry, field artillery, and coast artillery (antiaircraft). Instructive exercises at a large nearby airfield give members of this class a concise idea of Air Corps activities. This last summer usually includes also a trip of about two weeks to various important Army schools to see demonstrations of combat activities, and ends with a maneuver involving the combined arms. During the winter months of his final year, the cadet receives instruction in administration, air corps, motor transportation, and tactics.

Instruction in swimming begins in the first year and continues for each cadet until he is declared proficient. All classes receive practical instruction in fencing, gymnastic exercises, boxing, wrestling, swimming, and all forms of athletics.

There are two terms of academic instruction each year; from September 1 to December 23, and from January 2 to June 4. Cadets deficient in studies after any examination are discharged from the academy unless, for some special reason, the Academic Board recommends otherwise. Cadets who exceed at any time the maximum number of demerits allowed



Cadet chapel and barracks, U. S. Military Academy.

for 6 months are reported to the Academic Board as deficient in conduct and are discharged.

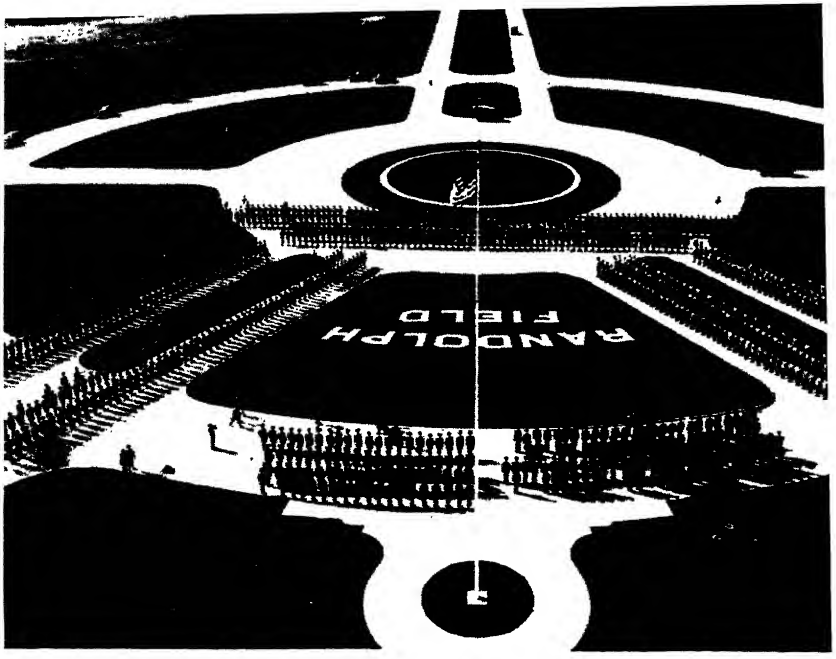
The pay of a cadet is $780 per year, and he receives, in addition, one ration of 60 cents per day but must pay for the meals furnished to him at the cadet mess.

The academic course is the same for each cadet. There are no elective subjects. In his first year, a fourth classman receives instruction in solid geometry, algebra, trigonometry, analytic geometry, plane surveying, French, and English; in his second (Third Class) year, the subjects are, differential and integral calculus, military topography, descriptive geometry, French, English, history, and physics; in his third (Second Class) year, they are natural and experimental philosophy (physics), chemistry, electricity, engineering drawing, and Spanish; in his fourth and last (First Class) year, the subjects which are studied are civil and military engineering, law, ordnance and gunnery, economics and government, and military hygiene.

Although the discipline is strict, and a cadet undergoes a vigorous course of military, academic, and physical training, there is time for recreation. Trips made each year to accompany athletic teams and to go as members of the cadet choirs bring about acquaintances and friendships with the midshipmen of the United States Naval Academy and with students of such universities as Columbia, Harvard, Yale, and Princeton. Many of the home games in all sports are attended by groups of students from other colleges and universities. Another important element in the education of a cadet is the broadening influence of his association with cadets from all States of the Union and from foreign countries. Life-long friendships are formed and nourished at the Military Academy in an atmosphere of scenic splendor and inspiring tradition.

When a cadet has gone through the classes of the Military Academy, and has received his diploma he is then commissioned as a second lieutenant in any arm or service of the Army in which there is a vacancy and the duties of which he has been judged competent to perform. The degree of bachelor of science is given to all graduates of the Military Academy at the time of graduation.

Roughly one-half of the officers of our Army gained their original commission through West Point. This ratio extends in general throughout all grades of rank except the more junior ones. In 1939, for example, the heads of the General Staff, and the instructors and student body at the Command and General Staff School, were almost evenly divided between those who came into the Army through the United States Military Academy and those who gained their first commissions in other ways. Since in recent years West Point has been the main source of new officers, the grades of second and first lieutenant now have a majority of Military Academy graduates.



Formation of cadets, Air Corps Training Center, Randolph Field, Tex.

The Army Air Corps Training Center

The Army Air Corps Training Center at Randolph and Kelly Fields, San Antonio, Tex., is the Air Corps center of instruction for young fliers of the Regular Army and other selected candidates for Army training as airplane pilots. Officers proceeding to the training center from West Point already have commissions in the Regular Army, and on completing the training remain in the Regular Army Air Corps. These officers, however, form only a fraction of those who take the courses at the Air Corps Training Center each year. The greater part are young men who have entered the training center as flying cadets direct from civil life.

Candidates for appointment as flying cadets must be unmarried male citizens, between 20 and 26 years old. Those who have not satisfactorily completed at least 2 years of standard college work must pass a written, educational examination. The physical standard for flying is high, especially as to vision, hearing, and the nervous system. Vision must be normal without glasses.

All qualified candidates are placed on a waiting list for assignment to the first class in which they can be accommodated at the Primary Flying School. Flying cadets are furnished Government transportation from their

Cadet instruction, using interphone, Air Corps Training Center, Randolph Field, Tex

places of enlistment to the schools. They receive pay at the rate of $75 per month while training, and a ration allowance of $1 per day. They are quartered at Government expense. A distinctive uniform and the flying equipment they will need are furnished.

The course of instruction at the Air Corps Training Center is given under the supervision of expert Army instructors. In addition to their hours in the air, flying cadets receive instruction in airplane engines, machine guns, navigation, and other subjects necessary for the trained military pilot.

On entering, the new flying cadet at once begins his military training, and at the end of two weeks his ground and air training as a flier begins.

Cadet class at motor test block, Air Corps Training Center, Randolph Field, Tex.

Flying cadets at chapel, Air Corps Training Center, Randolph Field, Tex.

The ground instruction consists of lectures, demonstrations, laboratory, and classroom work, and includes studies in theory of flight, airplane rigging, and structures. There are courses in airplane engines and trouble shooting; in air navigation, including maps, compasses, radio aids to navigation, and flying instruments; weather; radio code; and airplane weapons.

The work at the Air Corps Training Center is divided into three phases of approximately 4 months each: Primary flight training and basic flight training, both given at Randolph Field, followed by advanced training at Kelly Field. On completing the course, a flying cadet receives his "wings"

Checking cadet parachute adjustment, Air Corps Training Center, Randolph Field, Tex.

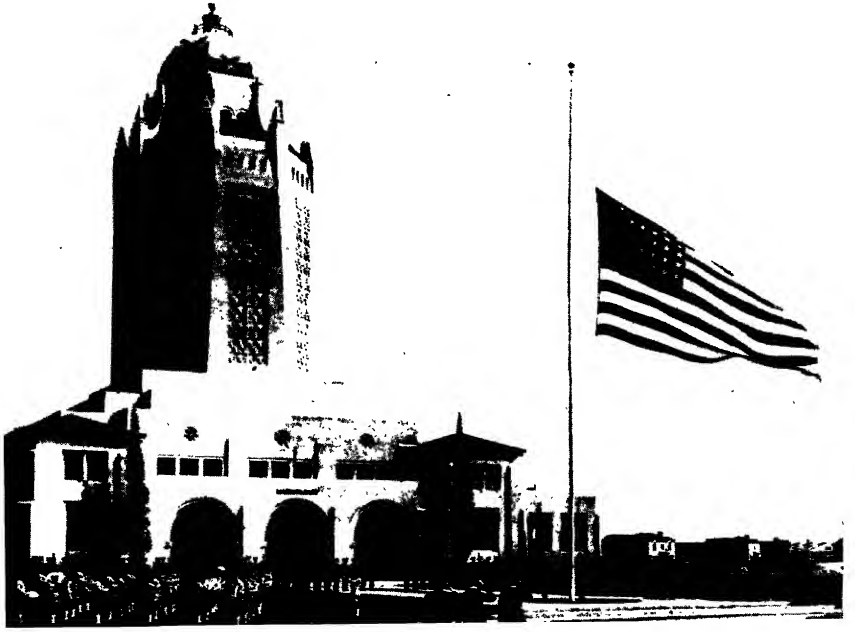
Cadet class in motor overhaul, Air Corps Training Center, Randolph Field, Tex.

and the rating of airplane pilot, and soon thereafter a commission as second lieutenant in the Air Corps Reserve.

After graduation they may then continue their Army flying careers with Air Corps units of the Regular Army. Congress makes appropriations to continue a number of them on full active duty for a period of several years. Some graduate flying cadets gain Regular Army Air Corps commissions by competitive examination.

The Air Corps expansion program has required an increase in the number of flying cadets. This program makes use of seven accredited civilian flying schools in different parts of the country for primary training with remaining training at the Air Corps Training Center.

Retreat formation, Randolph Field, Tex.



The Schools of the Arms and Services

At various Army posts in the United States are the "special service schools" of the arms and services. Besides these, there are in some branches certain technical and professional schools. These arm or service schools vary in size from large institutions with a hundred or more instructors and several hundred officers and enlisted students down to small schools with a few instructors and less than fifty students.

The main purpose of these schools is to train officers and enlisted men in the approved tactics of their own arms and services, and in the latest methods of warfare. The schools are also centers of new development where work is continually carried on to perfect weapons and methods. For such work, there is at most schools, in addition to the school itself, a branch "board" which conducts field tests and experiments to find the best possible weapons, equipment, and methods of warfare. In some arms and services, such as the Air Corps and the Medical Corps, testing and experimenting are done at separate schools, laboratories, and testing grounds.

There are also, at most of the branch schools, units of the Regular Army used in large part as experimental and demonstration troops by the school and by the branch board. The officers and enlisted men of these units also furnish personnel for the headquarters and staff of the Army post, thus freeing the schools themselves of administrative responsibilities.

In addition to the instruction of students, each school and each branch board also does much work in preparing official training regulations and other instructional matter used, not only in the school, but throughout the arm or service. This includes the preparation of the Army Extension Course lessons and textbooks, which comprises, at the larger schools, about one-third of the work done by instructors.

The schools of the combat arms and services have large reservations—areas where tactical exercises, target-range and other practice firing, and school maneuvers can be held. At these particular schools, the courses of instruction usually end in a maneuver in the field, which gives student officers and enlisted men the opportunity to put into practice what they have learned in theory.

Most of the schools have several different courses for officers and enlisted men which are described later on in this chapter. These courses vary from one month to ten months in length. In the schools of the combat arms and services, most of the student officers are in the grade of second or first lieutenant.

Many of the schools have regularly assigned instructors and students from other arms and services than that of the school itself. In this way

the various branches interchange ideas and make certain that the cooperation of all arms and services is clearly emphasized in all instruction. Officers of the Navy, Marine Corps, and the Philippine Army, and sometimes by special arrangement officers of foreign armies, may attend certain courses in certain schools.

The schools of the arms and services are conducted directly under the chiefs of the branches, and do not come under the commanders of the corps areas in which the schools are situated. Each school has a commandant, who commands not only the school but the post where it is. Under him is an assistant commandant, usually in direct charge of the school and its faculty and students. The schools of the arms and services are separately described in the pages immediately following.

Practically every officer in the Regular Army with more than 5 years of commissioned service, and thousands of National Guard and Reserve officers, and likewise many thousands of enlisted men in all components of the Army of the United States, are graduates of Army service schools. Many have completed more than one course at a single school, and a number are graduates of two or more. It is these schools, perhaps more than any other Army activity, that keep the Army as a whole, alert to the latest thought and means of conducting our national defense.

The Infantry School

The Infantry School is at Fort Benning in the western part of Georgia, on a large reservation of nearly 100,000 acres. To this modern, well-equipped school classes of selected officers and enlisted men are sent each year to learn the latest developments in the weapons, tactics, and supply of infantry units.

The school has about 76 officer instructors and 80 enlisted instructors. Several different classes attend the school each year. The Regular class consists of 110 officers, most of them first lieutenants with several years of commissioned service, who attend school daily for 9 months, studying the war operations of infantry units from the squad up to the regiment. This class thoroughly studies and fires the latest models of infantry weapons, learning how to train troops in the same kinds of firing. It also attends lectures and works out many map problems in the classroom and terrain exercises on the ground of the Fort Benning reservation.

The Regular class receives a limited amount of special instruction in signal communications to gain familiarity with radio, telegraph, telephone, and other means of sending and receiving messages. It also has work in military history and in the tactics of infantry tank units. The Regular course ends in a period of maneuvers in which the members of the class take command of troops in the field. These troops come from the infantry,

Rifleman with semiautomatic rifle.

infantry tank, field artillery, air corps, engineer, medical, chemical warfare, quartermaster, and other Regular troops of the large Fort Benning garrison.

The National Guard and Reserve officers' class consists of approximately 200 officers who attend a 3 months' course in the latter part of each school year. The work of this class is similar to that of the Regular class but more condensed. The infantry training of the Army's reserve components is thereby coordinated with that of the Regular Establishment.

The Tank class consists of about 35 Regular officers who take a 9 months' course devoted entirely to tanks. These officers study the mechanical aspects of tanks, taking engines apart and assembling them, and learning to drive tanks on all kinds of ground. They also study the tactical operations of tank units in warfare.

There are also four enlisted men's courses at the Infantry School where selected men of all components learn signal communications, tank operations and repair, and horseshoeing. About 175 men attend these courses.

The Cavalry School

The Cavalry School is located at the old frontier Army post of Fort Riley, Kans. Here an open rolling reservation of 20,000 acres gives ample room for instruction in mounted and mechanized tactics, and in other

Cavalry machine-gun unit.

training of the Cavalry arm. The school has 33 officer instructors, 16 enlisted instructors, and 1 civilian instructor.

The school teaches cavalry officers horsemanship, cavalry tactics, and the operation and use of cavalry weapons, gives them a working familiarity with the other arms and services, and qualifies them as instructors for duty with cavalry units of all components of the Army of the United States.

There are four officers' courses. The Regular Army course of 9 months is attended by 25 officers each year. The advanced equitation course of 9 months is attended by 15 officer students. The National Guard and Reserve officers' course of 3 months is attended by some 30 students. A refresher course is given from time to time for small groups of high ranking officers who return to Fort Riley to receive instruction in the latest developments in the Cavalry.

The Cavalry School also trains selected enlisted men of the arm as technicians and as enlisted instructors. The total number taking such training each year is about 135.

The Field Artillery School

The Field Artillery School is at Fort Sill, Okla., on a reservation of 51,000 acres. This school trains officers in the technique and tactics of the Field Artillery in its relation to the other arms and services in order to provide competent leaders for field artillery units and to qualify instructors for duty with the Field Artillery in all components in the Army. It also conducts courses to train selected enlisted men as technicians and instructors in the duties of enlisted specialists of the Field Artillery.

The Field Artillery School has 31 officer instructors, and 58 enlisted instructors. The main departments of instruction are: animal transport, gunnery, matériel, tactics and communication, and extension courses.

The courses given each year are as follows: the Regular course which lasts 9 months, attended by about 70 Regular Army officers; two National Guard and Reserve officers' courses of 3 months, attended by some 55 National Guard and 45 Reserve officers; the advanced course in horsemanship, a 9 months' course attended by 4 Regular Army officers; the advanced course in motors of 4½ months, attended by 8 Regular Army officers; the advanced course in communication of 4½ months, attended by 8 Regular Army officers; and the refresher course of 1 month, principally for field officers who have been detailed away from the Field Artillery.

There are also several courses for enlisted men of the Field Artillery, each of 3 or 4 months, attended by a total of some 260 students each year.

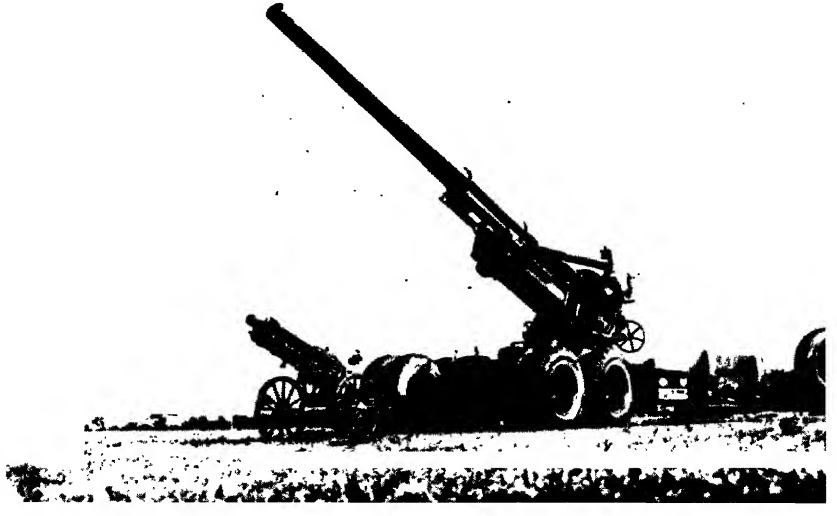
The Coast Artillery School

Established at Fort Monroe, Va., in 1824, as the "Artillery School of Practice" the Coast Artillery School is the oldest of the Army's special service schools. The school is conducted for the purpose of imparting technical and tactical knowledge to the Coast Artillery Corps. There are 25 Regular Army officer instructors and 21 enlisted instructors.

For Regular Army officers there is a course of 9 months' duration, which most lieutenants of Coast Artillery attend between their third and fifth years of service. Its primary purpose is to instruct battery officers in the organization, tactics, and technique of all classes of artillery in the Coast Artillery Corps. The students of this course number 44. There is a course of 3 months' duration for National Guard and Reserve officers attended by about 38 officers. In addition there is a 9 months' Advanced Technical Course, which includes specialized instruction in electricity, orientation, and communications, given for about 6 Regular Army students each year.

To produce skilled enlisted specialists for the Coast Artillery, the school conducts 9 months' courses in radio, electricity, and drafting and surveying.

Field Artillery 155-mm. gun, model M-1, with 75-mm. pack howitzer in front.



Maintenance crews working on mobile antiaircraft guns at Camp Buchanan, Puerto Rico.

Sunset at Fort de Lesseps, Panama Canal Zone.
Infantry unit of First Division using new infantry drill on maneuvers, winter of 1939-40.

Coast Artillery 3-inch antiaircraft gun and prime mover.

In addition, clerical training is given in special courses of 20 weeks' duration. Graduation from this section of the school opens the way to promotion to the highest noncommissioned grades. This department of the school also conducts special courses for enlisted men of the National Guard, and refresher courses for graduates of its Regular Army courses described above.

The Air Corps Schools

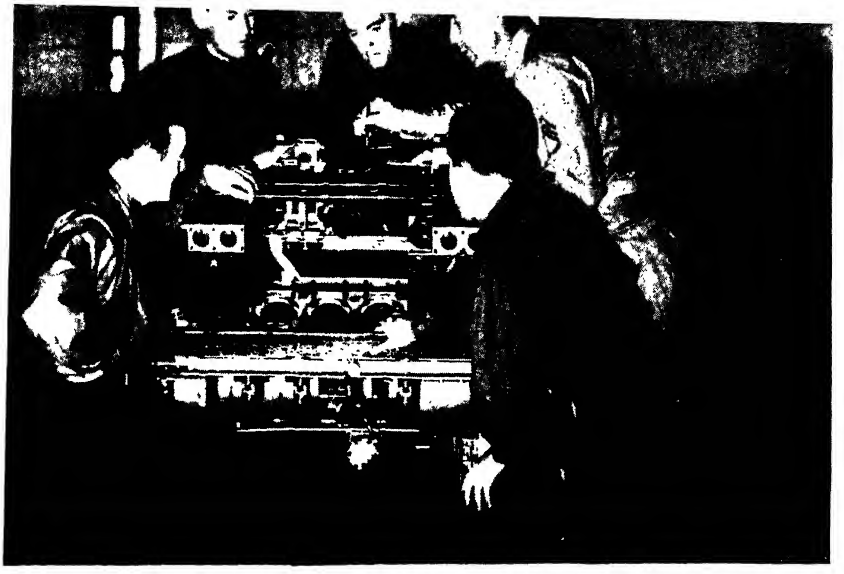
In addition to its Air Corps Training Center in Texas, described earlier in this chapter, where young officers and flying cadets earn their wings, the Air Corps, like the other arms, has its schools of higher training. There are three such schools: the Air Corps Tactical School, the Air Corps Technical School, and the Air Corps Engineering School. The data given below for these schools are for the school year 1938–39. The Army expansion program passed by Congress in 1939 caused all of these schools to be considerably enlarged in numbers of instructors, students, and courses.

The Air Corps Tactical School is at Maxwell Field, near Montgomery, Ala. Here officers of the Air Corps, after some years of service in their arm, return to study the duties of Air Corps staff and command in war. The school has 27 instructors, 20 from the Air Corps, 6 from other branches, and 1 from the Navy.

There are two courses. The Regular course lasts 9 months and is attended by 60 officers from the Air Corps, and 12 from other arms. The

Parachute loft (airing and inspection prior to packing).

course for selected National Guard and Reserve Officers lasts 2 months and is attended by some 15 officers. The work in both courses includes considerable instruction concerning the cooperation of the Air Corps with the other arms, and with the Navy, in the defense of our country.



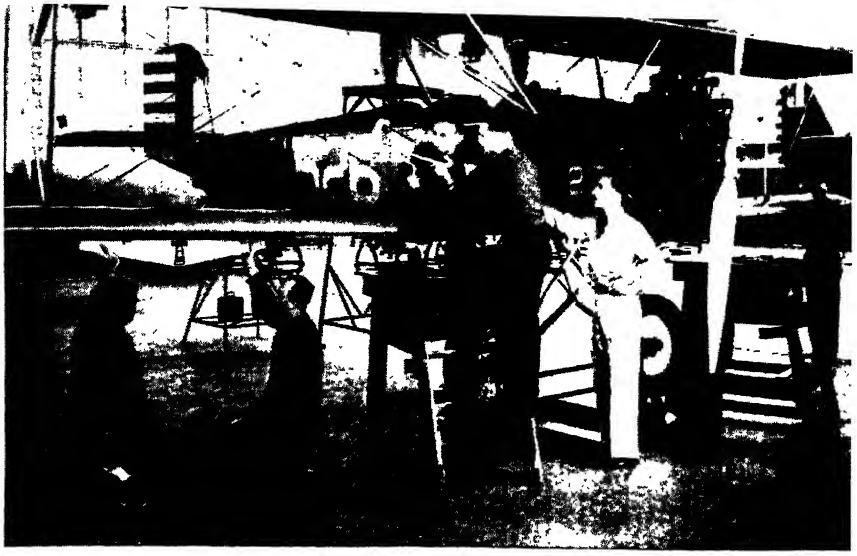
Cadet class in motor overhaul, Air Corps Training Center, Randolph Field, Tex.

The Air Corps Technical School is at Chanute Field, Rantoul, Ill., with a branch at Lowry Field, Denver, Colo. Approximately 2,000 Air Corps enlisted men took courses at this school during the school year 1938–39. This number was considerably increased by the 1939 expansion program.

At the Chanute Field school there are 11 officer instructors, 55 enlisted instructors, and 28 civilian instructors, a total of 94. Two courses for Regular Air Corps officers are given, one of 10 months' duration in airplane maintenance engineering attended by 18 officers per year, and a course of 9 months in Air Corps communications attended by 8 officers per year. There are also two 3 months' courses of the same kind each attended by five National Guard and Reserve officers.

At the Denver branch there are 56 instructors, 11 officers, 41 enlisted instructors, and 4 civilian instructors. A course of 7 months in Air Corps armament is given for 8 Regular officers, and one of about 10 months in air photography for 6 officers. There is a National Guard and Reserve officers' course in photography of 3 months attended by 10 officers.

Air Corps enlisted experts, however, make up the bulk of the students at this school and its branch. At Chanute Field the 10 different courses given vary from 8 to 32 weeks in length, and each year from 4 to 18 different classes are instructed in the different courses. About 450 enlisted students, in groups of 25, attend the course for airplane mechanics and a like number, in groups of 44, attend the course for radio repairers and operators. About



Cadet class in rigging, Air Corps Training Center, Randolph Field, Tex.

50 men each complete the courses each year for aircraft machinists, welders and metal workers, parachute riggers, and specialists in carburetors, instruments, propellers, and electrical repair. The total of enlisted students at Chanute Field is nearly 1,300.

At Lowry Field the enlisted courses run from 12 to 28 weeks in length and from 1 to 4 classes attend each course in a year's time. The classes vary from 12 to 30 enlisted men who attend such courses as the following: bomb sight maintenance; primary attack, bombardment, observation, and pursuit armorers; advanced armorers; master armorers; primary, secondary, and advanced photography, and Air Corps supply and technical clerks. About 550 enlisted students take these courses each year.

The Air Corps Engineering School is at Wright Field, Dayton, Ohio. Here a year's course is given for 10 Regular Air Corps officers. There is 1 officer instructor, 2 civilian instructors, and several part-time civilian instructors.

There is also an Air Corps Weather School at Fairfield Air Depot, Ohio, where a course of several months duration in meteorology is given to train specialists for duty with Air Corps weather squadrons.

The Air Corps system of schools is the most extensive in any arm. Including the students at the Air Corps Training Center, at Randolph and Kelly Field, Texas, the students in Air Corps schools during the school year of 1938–39 were as shown in the table on page 166.

Officers	303
Flying cadets	1,390
Enlisted men	1,852
Total	3,545

The program of Air Corps expansion of 1939 increased the number of courses and students in all of the schools described above. A series of 8, 28-week courses was also instituted at 7 civilian schools for the training of 1,000 new airplane and engine mechanics for the Air Corps.

The Engineer School

The Engineer School at Fort Belvoir, Va., on the Potomac River near Mount Vernon, is the training center of the Corps of Engineers, where young engineer officers are taught the practical application of their previous technical engineering studies.

This school has 13 officer instructors and 11 enlisted instructors. It conducts two courses for officers and four for enlisted men. There is a 9 months' course for engineer officers of the Regular Army, about 40 of whom attend each year. A newly commissioned engineer officer is first sent for 2 years either to duty with troops or on civil work in a river and harbor district. He is then sent to a civil-engineering college, where he specializes in some branch of engineering and obtains a degree. He may also obtain a fellowship and continue his academic studies to obtain a master's or doctor's degree, either at an American or a foreign university. Upon completing his special work, he is then sent to the Engineer School to take the Regular course.

This course consists mainly of tactics and technique of Engineers and of the other combat arms, field and permanent fortifications, coast defense and naval power, surveying and map making, equitation, motor transportation, and engineering construction of the types done in the river and harbor districts throughout the country by Army engineers. (River and harbor work is described in detail later in this book.) There is also a 3 months' course for some 30 selected National Guard and Reserve officers of the Corps of Engineers, in which similar courses are given.

There are four courses for engineer enlisted men. In the Enlisted Specialist's School, surveying, drafting, aerial photographic mapping, map reproduction, photography, operation of gasoline and electrical equipment, and water purification are the subjects taught. Specially qualified enlisted men from all engineer units of the Army, and by special arrangement, a few qualified men from the Field Artillery, Air Corps, and Marine Corps take a 9 months' course in different subjects. A special 3 months' refresher course for National Guard noncommissioned officers and Regular

Cadet class in radio communication, Air Corps Training Center, Randolph Field, Tex.

Army noncommissioned officer instructors with the National Guard, is also held. The total of enlisted students is about 70 each year.

The Signal Corps School

The Signal Corps School is at Fort Monmouth, Oceanport, N. J. Here officers of the Signal Corps and other branches take courses in which they learn the latest methods of Army signal communication, and become qualified to give communication instruction.

The school has 10 officer instructors and 27 enlisted instructors. There are several courses for officers and enlisted men.

The Regular course of 9 months' duration fits officers for duty with Signal Corps units of infantry and cavalry divisions and with signal battalions, and for duty as post signal officers. Selected officers of other arms and of the Marine Corps are also enrolled. The course includes instruction in elementary telephone, telegraph, and radio engineering; methods of signal-communication training; and the employment of signal-communication troops in war. About 25 student officers complete this course each year.

The refresher course of 3 months, held from time to time, gives selected Signal Corps officers a general review of the duties of corps and division signal officers and familiarizes them with recent developments in signal-communication equipment and methods.

The National Guard and Reserve Officers' Course of 3 months for 25 officers provides qualified signal and communication officers for these two components. It parallels the Regular course in scope but is considerably condensed.

The two main courses conducted for enlisted men are the radio communication course and the wire communication course, each for 10 months. In the radio course the students learn to be radio operators and to take care of and repair field and permanent radio sets. Students who show exceptional ability as radio operators are further trained as intercept operators, with a view to their future employment in radio intelligence units, which, in war, listen in and report the radio messages sent by the enemy. In the wire course the students learn to install, operate, take care of, and repair field telephone and telegraph circuits and equipment, and permanent telephone and telegraph systems. Selected students from this course receive additional training in taking care of and repairing printer telegraph (teletype) equipment.

There is a refresher course for sergeant-instructors on duty with the National Guard Signal Corps units, which familiarizes them with recent developments in signal communication equipment and technique. A course is also given for noncommissioned officers of the National Guard, to provide the Guard with competent noncomissioned signal communication personnel. Some 300 enlisted men in all attend these various courses.

The Chemical Warfare School

The Chemical Warfare School at Edgewood Arsenal, Md., qualifies officers and enlisted men of the various arms and services to act as instructors in gas defense and also develops weapons and chemicals for possible use in a war if the opposing force should initiate chemical operations against our troops. There are 8 officer instructors and 1 enlisted instructor. Personnel of the Regular Army, Navy, and Marine Corps, and of the National Guard and Organized Reserves receive instruction at this school. The 165 student officers come mainly from the other arms and services to receive chemical warfare instruction. The courses vary in length from 4 weeks to 3 months. The total of officer students each year is about 165, and of enlisted students, about 50. Five courses are conducted each year. The instruction covers: chemical warfare agents (gases and smokes), chemical warfare weapons, weather, chemical tactics, chemical warfare training, and protection against chemicals.

Chemical agents are used by all the combat arms, but especially by chemical troops, artillery, and the Air Corps. A large part of the instruction is devoted to exercises illustrating the action that must be taken in war by troops of all arms in the use of smoke or gas.

Cavalrymen advancing through gas.

The Schools of the Quartermaster Corps

The Quartermaster Corps has several schools. The Quartermaster School gives general courses of quartermaster training for officers. The Motor Transport School gives technical training in motor vehicles. The Subsistence Research Laboratory studies Army foods and gives courses in this subject. The Quartermaster Corps also has 12 schools for bakers and cooks. These schools are described in detail just below.

The Quartermaster School, at Schuylkill Arsenal, Philadelphia, Pa., has a faculty of 13 officers and 2 enlisted men, and gives two courses each year.

The Regular officers' course is attended by 40 student officers and lasts for 9 months. The instruction given covers the technical, supply, and administrative functions of the Quartermaster Corps battalions and regiments in infantry and cavalry divisions and larger fighting units.

The warrant officers' and enlisted men's course lasts about 8 months and is attended by 65 men. It qualifies the students as administrative assistants and clerks. Instruction is given in such subjects as bookkeeping, commercial arithmetic, mess management, procuring, inspecting, and accounting for Army supplies, rail and water transportation, and construction, repair, and operation of utilities plants.

The Motor Transport School is at Holabird Quartermaster Depot, Baltimore, Md. It has 7 officer and 9 enlisted instructors and is a center of motor vehicle development as well as a school. The officer's course, attended by 20 student officers each year, consists of 13 weeks of instruction in the management of Army motor vehicles in war and peace. Inspection

of motors and shops, garage management, and operation of motor convoys and pools are among the subjects covered. There is a similar course of 8 weeks' duration attended by 15 National Guard and Reserve officers.

There are two enlisted men's courses, one of 9 months' duration for mechanics attended by 140 students, and a specialist's course for selected men. These courses train enlisted assistants to motor transport officers, truckmasters, shop foremen, and other enlisted specialists.

The Quartermaster Corps also maintains 12 schools for bakers and cooks, one in each corps area and overseas department. The men who graduate from these schools are the men who feed the Army. Selected enlisted men take a course of 4 months to learn to be bakers or cooks, and there are also courses for mess officers and mess sergeants.

The course in cooking covers such subjects as: determination of the quality of fresh meat, canned goods, and fresh produce; kitchen and mess-hall sanitation; food storage and refrigeration; meat cutting; the use and

Troops at mess in the field.

care of kitchen utensils and equipment; preparation of raw foods for cooking; cooking of all types; kitchen baking and pastry work; seasoning, garnishing, and serving foods; and food costs and mess accounting. Those who take this work go into the many hundreds of Army kitchens to prepare and serve the Army's excellent meals.

The Army operates 87 bakeries and produces approximately 28,260,000 pounds of bread per year. The skilled men required for this service get their training at these schools for bakers and cooks.

The Quartermaster Corps maintains at the Chicago Quartermaster Depot, Chicago, Ill., a subsistence research laboratory where new types of food and new processes of manufacture receive a thorough and intensive test to determine their possibilities for Army use. This laboratory conducts 4-month courses for Quartermaster Corps noncommissioned officers in which they study food standards of quality and methods of making food inspections.

The Ordnance Department Schools

The Ordnance Department has two schools, the Ordnance School and the Ordnance Field Service School, where members of this department receive a thorough technical training in the many specialized duties of their service which were described above in Chapter III.

The Ordnance School trains junior officers of the department in their military, engineering, and industrial duties, including their activities as ordnance officers with troops. The school has four officer instructors. The length of the course is 2 years and about 12 officers begin the course each year. During the first year the students are stationed at the Watertown Arsenal, Watertown, Mass. They attend classes at both the Arsenal and at Massachusetts Institute of Technology. During their second year, the students are taken on a summer tour of industrial plants, and also go to Picatinny Arsenal, N. J., and Frankford Arsenal, Philadelphia, Pa., where they study powder and explosives. The final 8 months of the course consists of intensive work at Aberdeen Proving Ground, Md. The course covers such subjects as chemistry, mechanics, electrical engineering, plant engineering, manufacturing processes, metallurgy, powder and explosives, automotive matériel, artillery and small-arms matériel, ballistics, machine-shop practice, and industrial management.

The Ordnance Field Service School at Raritan Arsenal, Metuchen, N. J., is maintained primarily for the instruction of enlisted men. There are 3 officer instructors and 17 enlisted instructors. A noncommissioned officers' course is conducted each year for some 25 selected students. There are also enlisted specialists' courses for armorers, artillery mechanics, auto mechanics, carpenters, clerks, instrument repairmen, machinists, munitions

workers, and welders, given for about 100 enlisted men each year. Preparations were under way, in 1939, including construction of buildings and facilities, to move this school to Aberdeen Proving Ground, Md., and combine it with the Ordnance School.

The Medical Department Schools

The Medical Department conducts both professional and service schools for the training of its members. The professional schools are all at the Army Medical Center in Washington, D. C., and the Medical Field Service School is at Carlisle Barracks, Carlisle, Pa. The School of Aviation Medicine at Randolph Field, Tex., and its several branches at other Air Corps stations, conducted under the direction of the Air Corps, train Regular and Reserve medical officers as flight surgeons.

The Army does not conduct a medical, dental, or veterinary college. New officers commissioned in the Medical Corps are selected graduates of medical schools legally authorized to confer the degree of doctor of medicine. They must be citizens of the United States between 23 and 32 years of age, who have accepted a commission in the Medical Corps Reserve. They must have had at least 1 year's hospital training after completing a 4-year medical course. Those who seek commission as medical officers must also pass physical and professional examinations. Those who possess the required qualifications receive commissions as first lieutenants to fill vacancies in the Medical Corps of the Regular Army.

The qualifications for gaining a commission in the Dental Corps are similar, except that after graduation from a recognized dental college the candidate must have engaged in the practice of his profession for 2 years. Successful candidates are commissioned as first lieutenants in the Dental Corps as vacancies occur.

To be commissioned in the Veterinary Corps, a candidate must pass similar examinations. He must be a citizen between 23 and 32 years old and must have a satisfactory general education. He must be a graduate of an acceptable veterinary college legally authorized to confer the degree of doctor of veterinary medicine or its equivalent. Successful candidates are commissioned as first lieutenants in the Veterinary Corps to fill vacancies as they occur.

The Army Medical School at the Army Medical Center has 35 officer instructors and 12 enlisted instructors. This school has a 4 months' basic graduate course attended by newly commissioned medical officers, and an advanced graduate course of the same length attended by officers of longer service. Professional specialists' courses are given to keep medical officers

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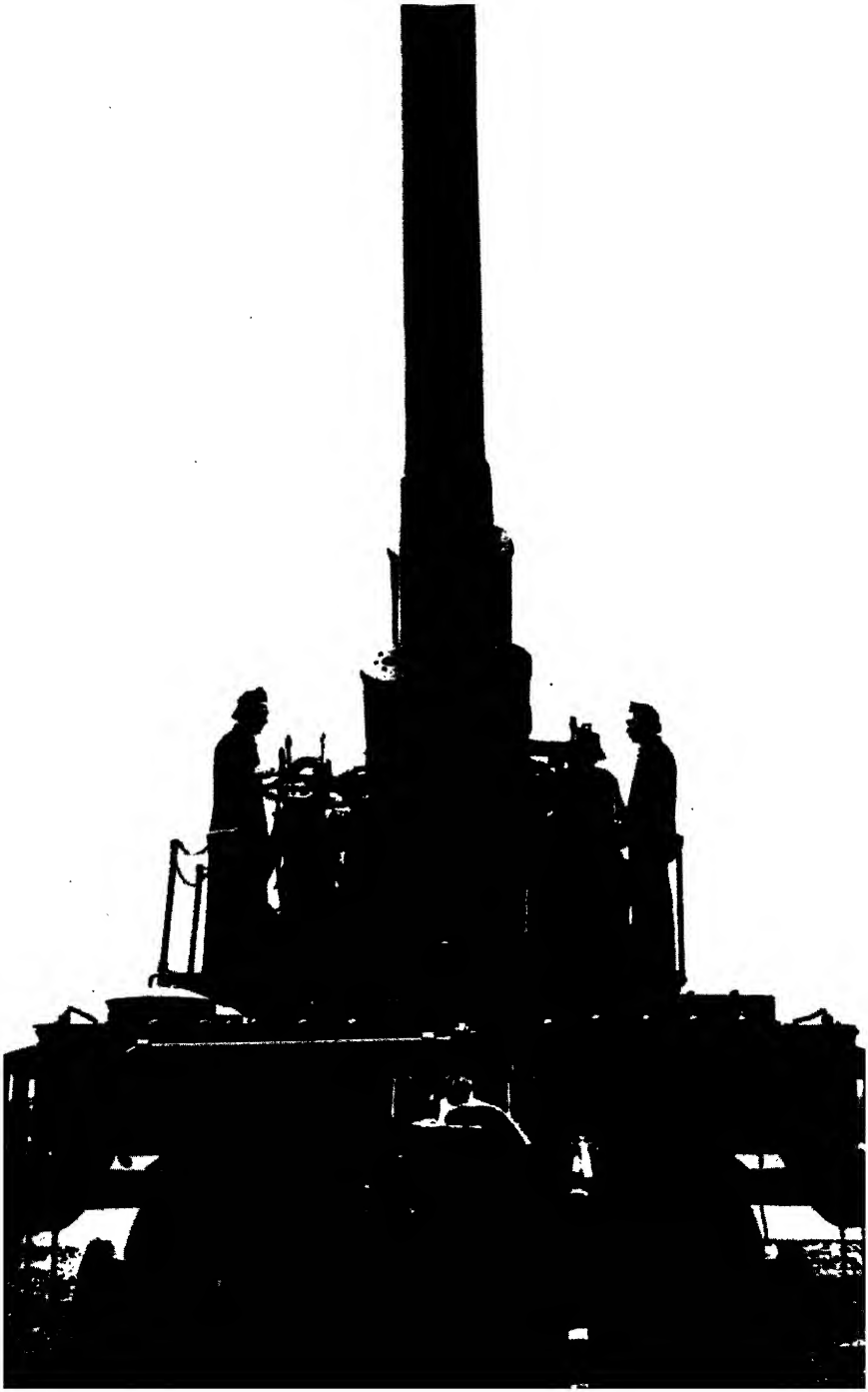
Coast Artillery railway gun.



Walter Reed General Hospital, Washington, D. C.

abreast of new developments. Special training is also given at the general hospitals of the Army and at the larger civil hospitals and medical schools. Classes of about 40 enlisted men attend annual courses of a year's duration for X-ray and laboratory technicians at this school.

Courses are given to qualified women candidates leading to diplomas as dietitians and junior physical therapy aides. Selected graduates are subsequently employed in Army hospitals. Special courses in anaesthesia are given to members of the Army Nurse Corps.

The Army Dental School, which has 10 officer instructors and 2 enlisted instructors, gives a 3 months' advanced graduate course to small classes of officers, and professional specialists' courses from time to time. A class of 31 enlisted men attends the annual course of a year's duration given for dental technicians.

The Army Veterinary School has 4 officer instructors and 3 enlisted instructors, and gives basic, advanced graduate, and professional specialists' courses for officers. The enlisted men's course of 4 months for veterinary technicians is attended by enlisted men of the Regular Army and National Guard.

At the Medical Field Service School, the wartime duties of the Medical

Officers' class in bacteriology, Army Medical Center.

Department, with special reference to its mobile field units of the combat area and its wartime installations in the rear, are taught to medical officers and enlisted men of all components of the Army. The faculty of this school numbers 15 officer instructors from the Medical Corps and 1 liaison officer from the Infantry.

The Regular basic course lasts 5 months and is attended by all newly appointed medical officers. This course places emphasis on field sanitation, and on the administration, training, and combat operation of mobile medical units. The advanced course of 3 months covers the larger aspects of medical field service in war and is taken by older officers of the Medical Corps. The 6 weeks' course for National Guard and Reserve medical officers prepares these officers for service in infantry and cavalry divisions in war. Enlisted men of the Regular Army and the National Guard attend the noncommissioned officers' course of 2 months' duration for instruction in their duties in mobile field units in war.

The Equipment Laboratory at the Medical Field Service School devises and tests new equipment for medical units. Cross-country motor ambulances, light horse-drawn ambulances, first-aid kits for use in airplanes, and motorized surgical operating equipment are typical developments.

The Physiological Research Unit, a part of the Dayton Air Corps Laboratory, further trains flight surgeons in testing and developing equipment to enable members of the Air Corps to fly efficiently, particularly at high altitudes where the rarefied atmosphere adversely affects the human body.

The Finance School

The Finance School is at Holabird Quartermaster Depot, Baltimore, Md. The school staff and detachment consists of 1 officer, 1 warrant officer, and 10 enlisted men who give instruction in Finance Department procedure.

A course of 5 months' duration for about 40 to 60 enlisted men is given twice each year. Instruction is given in disbursing and accounting, property auditing, typewriting, correspondence, filing, and other similar subjects. Visits of inspection are made to the Finance Department activities in Washington. The course is open to all qualified enlisted men of the Army who require the special clerical training afforded.

Courses of instruction are also given to commissioned officers who are newly assigned to the Finance Department. This training is done by individual instruction and is not scheduled. There is a further special course each summer after the graduation exercises at the United States Military Academy—a 2 weeks' period of instruction in finance procedure for newly commissioned graduates.

In addition to resident instruction, the school also conducts a home study course, open to interested enlisted men and civilian employees of the War Department. This course is in addition to the Army Extension Courses of the Finance School which are prepared by the Finance School.

The Chaplains' School

The Chaplains' School, at Fort Leavenworth, Kans., has not held regular sessions for several years owing to the small number of chaplains in the Regular Army, the services of all of whom are urgently needed at the various Army posts. The school remains active, however, in preparing extension courses which are studied mainly by the chaplains of the National Guard and the Reserve Corps. These courses are also used by chaplains of the Regular Army as refresher courses, and by newly appointed chaplains to obtain a knowledge of the military requirements for chaplains and the customs of the service.

Officers Attending Other Schools in the United States

Officers of the Army may be ordered to take certain courses at universities or other institutions in addition to attending purely military schools. This gives selected officers higher training in special fields of work. The list given below for 1939 shows the studies pursued and the number of students. Some undergo this advanced work in preparation for teaching at West Point; some are being trained for legal duties in the Judge Advocate General's Department; others are keeping abreast in engineering and other technical fields which are of special interest to their arms or services.

Institution	*Subjects*	*Students*
Naval War College	Naval strategy and tactics: international law.	-
California Institute of Technology	Meteorology; aeronautical engineering.	5
Massachusetts Institute of Technology.	Meteorology; engineering; communication; ordnance.	23
University of Michigan	Aeronautical engineering; highway transportation; advanced physics.	2
Leland Stanford, Jr., University	Aeronautical engineering; medicine.	1
Cornell University	Engineering subjects	14
University of California	Engineering subjects; law; advanced physics, sound and flash ranging.	14
New Jersey Bell Telephone Co	Telephony	2
Ohio State University	Communications engineering	1
Academy of Motion Picture Arts and Sciences.	Motion-picture photography	1
Georgetown University	Law	4
University of Virginia	do	6
George Washington University	Law; opthalmology	1
Lowell Textile Institute	Textile engineering	1
Babson Institute	Business administration	1
Harvard University	Public health; cardiology	6
Johns Hopkins University	Public health	1
St. Elizabeths Hospital	Psychiatry	1
University of Kentucky	Animal breeding	1
New York Polyclinic Hospital	Practitioners course	1
New York Polyclinic School	Internal medicine	1
Massachusetts General Hospital	Cardiology	1
Queens Hospital, Honolulu	Internal medicine	1
New York University and Bellevue Hospital.	Cardiology	1
Jewish Hospital, Philadelphia	Anaesthesia	3
Dr. Jackson's Clinic	Bronchoscopy	1
New York Post Graduate School	Physical diagnosis, surgery	2
Tulane University	Surgery	1
Hertzler Clinic	Pathology	1
Dr. Blair's Clinic	Plastic surgery	1
Harvard School of Public Health	Virus diseases	4
Mayo Foundation	Surgery; orthopedic surgery	3
Department of Agriculture	Blueprint reading	2
Columbia University	Opthalmology; orthopedic surgery; orthodontia; languages.	15
Graduate School of Business, Harvard University.	Business administration	1
Daniel Guggenheim School of Aeronautics, New York University.	Aeronautical engineering	1
Department of Justice	Department procedure	2

Officers in Foreign Schools

For various purposes, about 25 officers of the Regular Army are on duty as students in foreign countries. Some are taking courses in the schools of foreign armies; some are attending technical schools; and some are studying as language students, either to become instructors at West Point or to serve later as military attachés or as staff officers on duties requiring a thorough familiarity with the language and customs of some particular nation.

At the beginning of 1939 there were two officers at the *École Superieure de Guerre* of France taking the 2-year course given for French staff officers. Two others were attending the similar course at the German *Kriegsakademie*. These schools are similar in their scope to our own Command and General Staff School at Fort Leavenworth. Six were studying at the *Sorbonne* and other French civil institutions in preparation for becoming instructors of French at our Military Academy. Two were at the University of Mexico studying Spanish.

There were also 9 officers in Japan, and 4 in China, spending 4 years in acquiring proficiency in the language.

The Command and General Staff School

The purpose of the Command and General Staff School at Fort Leavenworth, Kans., is to teach officers of our Army how to command large units—divisions and corps—and to instruct them in the duties of general staff officers. Selected officers of nearly every arm and service, who have already graduated from the special service schools of their own branches, go to the Command and General Staff School for an intensive year of professional study. There is a 10 months' course for Regular Army officers, and one of 3 months' for National Guard and Reserve officers. About 225 Regular Army officers and 50 National Guard and Reserve officers attend each year. There are 70 Regular Army officers on duty with the school as instructors. The total personnel stationed at the post of Fort Leavenworth comprises 126 officers, 3 warrant officers, and 1,292 enlisted men not including the students.

The course of instruction is designed to develop those competent to lead our armies under the trying conditions of modern warfare. In order to approximate the conditions of war, the Command and General Staff School lays emphasis on instruction through realistic map problems and terrain exercises. In its problems the school strives to teach general principles and not rules. Aside from review, it does not teach the mechanics of the various arms and services, since the special service schools exist for that purpose. Where their course of instruction ends, that at Fort Leavenworth begins,

and there the instruction deals mainly in the cooperation of the combined arms and services.

The training at this school for staff and command duty endeavors to insure sound tactical thinking and coordinated methods. Its graduates work efficiently in all components, and in all arms and services of the Army, usually in assignments of important responsibility.

The Army Industrial College

The Army Industrial College trains officers of the Army and Navy for duties in connection with procurement planning, supervision of procurement both in peace and war, and planning for the adequate mobilization of industry and the efficient use of economic resources in time of war. These important planning activities, vital to an adequate national defense, have been explained earlier in this book in the sections of chapter I in which were covered the duties of The Assistant Secretary of War, and the Industrial Mobilization Plan.

The Army Industrial College in Washington, D. C., is under the supervision of the Assistant Secretary of War. It has a faculty of 8 Regular Army officers, 1 Navy officer, and 1 Marine Corps officer. In the student body are 62 officers selected from Army, Navy, and Marine Corps, the majority of these belonging to the various supply arms and services of the Army.

Instruction is conducted generally by the problem method and the course is divided into three main parts. The first part covers the fundamentals of procurement—the fundamentals of business, including business principles, practices, organization, a knowledge of productive industry, and its economic factors and the problems of management; the characteristics of basic industries, the organization of the Government; and the procurement aspects of the War and Navy Departments in considerable detail. The second part of the course covers procurement planning and the third part covers the utilization of economic resources in war.

Most of the work in the Army Industrial College Course is accomplished through studies made by student committees. Throughout the course, however, many prominent leaders of the business, labor, educational, and governmental fields appear as lecturers before the student body.

Academic Building, Command and General Staff School, Fort Leavenworth, Kans.

Academic Building, Army War College, Washington, D. C.

The Army War College

The Army War College, at Washington, D. C., in the words of its founder, Elihu Root, who was Secretary of War under Presidents William McKinley and Theodore Roosevelt, is "a college . . . established for an advanced course of professional training for Army officers." The War College trains officers for the most important duties in the Army. It trains them for wartime command and staff positions in field armies and in the General Headquarters of the entire Army. It instructs officers in political, economic, and social matters that influence the conduct of war. It provides instruction in the large operations of past wars, especially of the wars of our country. Officers are also trained in general staff procedure. The course includes training in joint operations of the Army and Navy.

The officers who receive this training are of the rank of captain or above, specially selected from those who have shown judgment, capacity, and willingness of application, and who have demonstrated their suitability for training in the highest command or staff duty by their work in other schools and by their Army records. The student body consists of about 90 officers of the Regular Army, and from 6 to 10 officers of the Navy and Marine Corps. The course is 9 months long, running from September to June.

The faculty personnel consists of the commandant, the assistant commandant, the executive officer, 13 Army instructors, and 1 Navy instructor. In general the instruction consists of courses that cover matters corresponding to the work done by the main divisions of the War Department General

The First Divison on Maneuvers, winter of 1939–40, at Fort Benning, Ga.

staff. In addition to lectures by the faculty, recognized civilian authorities give lectures which pertain to various parts of the courses.

The Historical Section of the Army War College is engaged principally in a study and compilation of data from the records of the World War. Its research, however, is by no means confined to this, but extends into the broad field of all military history. Much of its work is of direct assistance to the War College in the conduct of its studies.

The Army Music School and the United States Army Band

The Army War College is also the home of the Army Music School and the United States Army Band. The Army Music School, formed for the purpose of training musicians for the many bands of the Regular Army, has been inactive in recent years; this practical training being carried on in each of the many bands in Army units.

The Army Band broadcasts regular programs three times each week over three major radio chains, in addition to special radio programs at other times. The band leads the inaugural parades, and takes part in all other important ceremonies held in Washington. During the summer it plays public concerts daily except Sunday at various places in the Capital City.

The band also makes frequent trips to other cities to play at expositions, ceremonies, and conventions of a national scope, and usually goes on a concert tour of 6 weeks in the fall. Occasionally this tour has included the entire country to the West coast.

Caring for refugees.

CHAPTER V

THE NON-MILITARY ACTIVITIES OF THE ARMY OF THE UNITED STATES

THE activities of our Army are not all purely military. All components of the Army, in time of serious disaster, assist the people of the stricken areas. The Army performs administrative functions in connection with the Civilian Conservation Corps. Indeed, almost since our Government was founded the Army's widespread organization has been used to direct or assist in many important nonmilitary activities. In the early days, the Army explored new regions and laid out trails and roads which opened them to civilization. Today, the Army supervises and directs the planning and carrying out of many of the country's largest public works. The Army also operates the Alaska Communications System.

Coast Artillery searchlights, Panama Canal Zone.

Disaster Relief

Disasters may strike whole communities and cover vast areas when storms, floods, great fires, or earthquakes occur. The organization of the War Department extends throughout our country, and in such times of acute distress the Army does its part in giving aid. Since the Army must always have on hand reserve war stocks of such equipment as tents, blankets, and kitchens, its aid can often be rapid and efficient.

The governments of the various States also answer such calls of distress with their military resources employed under their own direction, or, in great emergencies, under Federal direction.

In carrying out such measures, the Army cannot assume responsibilities beyond those which experience has shown will meet with the approval of Congress. Thus the use of Regular Army resources for relief is limited to those which the National Guard of States in a stricken area, the American Red Cross, and local relief organizations cannot furnish.

All corps areas have plans prepared for rapidly putting relief measures into effect. These plans are laid in considerable detail for areas where extensive floods are probable. When the need arises, the corps area commander, assuming active control, makes every Regular Army resource available to those in need, and coordinates this work with the relief measures taken by the National Guard, which operates in each affected State under similar plans. Since the home stations of the Guard are widespread in some 2,000 different cities and towns, its units are usually the first troops to reach a scene of disaster.

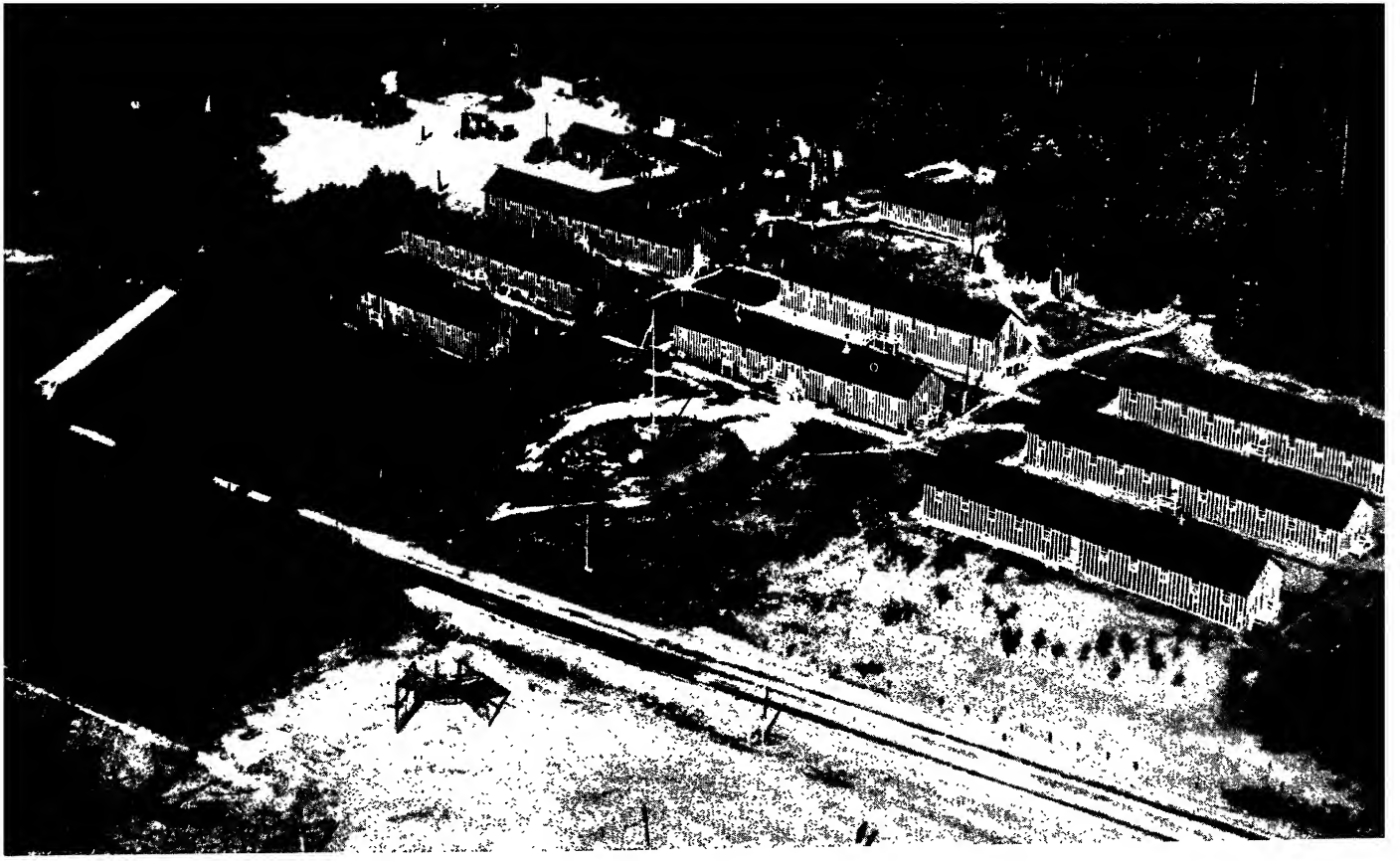
Medical care of flood refugees.

The War Department also has advance arrangements for close cooperation with the Red Cross in all legitimate ways. It looks to the Red Cross as the responsible general coordinating body of all relief activities. In case of disaster, the Red Cross informs the War Department of its urgent needs beyond its own resources and beyond those of the relief agencies in the stricken area, and then the Army takes immediate action to help.

Troops are sent to critical points to rescue, aid, and protect disaster refugees. National Guard and Regular Army forces alike carry out many other relief services. Air Corps units reconnoiter the critical areas by plane so that aid can be sent more speedily to points where it is needed. Planes are also used to carry supplies to persons cut off from other help, and may be used to remove injured persons to hospitals outside the area. The Signal Corps sets up temporary radio and other communications for the direction of relief measures. Medical units assist in caring for the injured and in safeguarding life and health through measures to prevent sickness and spread of disease. When there is need for clothing, food, tents, and other emergency camp supplies, these are shipped or brought by truck from Army quartermaster depots and National Guard armories, and distributed in cooperation with the Red Cross.

The Army has given aid in many past disasters. After the San Francisco catastrophe of 1906, the Army took charge, fed and sheltered the homeless, vigorously suppressed looting. It assisted in the Ohio and Mississippi floods of 1912, the Galveston flood of 1915, and the disastrous Vermont flood of 1927. In the Ohio River floods of 1937 all components of the Army rendered assistance. A large number of Regular Army and National Guard units, and volunteer groups of Reserve officers, assisted civil agencies in the work of rescuing, sheltering, and feeding refugees.

Flooded area in Kentucky, 1937.



The Civilian Conservation Corps

The Civilian Conservation Corps, established by act of Congress in 1933, was enrolled, outfitted, and organized into companies, camps, and districts, by the Army. The Army still administers the CCC, furnishes it with food, clothing, and other supplies, and with medical care; builds and maintains its camps; and examines and enrolls new CCC members.

Since the latter part of 1939, the companies of the CCC have been commanded by Federal civilian employees selected from the Officers' Reserve Corps of the Army, and the Naval and Marine Reserve Corps. However, the officers on full time duty with the Civilian Conservation Corps on June 30, 1939, were as follows:

Regular Army	115
Officers' Reserve Corps	4,617
Naval and Marine Reserve	163
Permanent warrant officers of the Coast Guard	80
Warrant officers, U. S. Army	4

The Regular Army officers now with the CCC are mainly those in charge of the several districts into which each corps area is divided, and their staff assistants. But since the Regular Army uses its existing supply, medical, and finance services on various Army posts to handle CCC matters, many other members of the Regular Army actually devote a part of their time to duties with this corps.

The CCC is not, however, in any way a part of the Army. Its head is a civilian Government official, the Director of the Civilian Conservation Corps, whose office is in Washington, D.C. The Director coordinates the work of the five agencies which have chief interest in the CCC—the War Department, the Department of Agriculture, the Department of Labor, the Department of the Interior, and the Veterans' Administration. Each of these Government departments has a representative on the director's advisory council.

The Department of Labor designates the agencies in the different States to select all applicants for the CCC, except for World War veterans. Applicants for enrollment in the companies of veterans, which form about one-tenth of the CCC, are selected by the Veterans' Administration. The Department of Agriculture, mainly through its United States Forest Service, furnishes the CCC project superintendents and their assistants, who directly supervise the daily work of the CCC members on national forests, and give general supervision over the forestry work done by the CCC on State and private lands. Similar general supervision is furnished by the Soil Conser-

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Civilian Conservation Corps camp.

vation Service, the Bureau of Agricultural Engineering, and the Bureau of Biological Survey of the Department of Agriculture, and by the National Park Service, the General Land Office, and the Bureau of Reclamation of the Department of the Interior; and also by the Tennessee Valley Authority.

The Director of the CCC, acting through the Army and the other agencies mentioned above, carries out the purpose of the CCC, which is to provide employment and vocational training for youthful citizens of the United States, and to a limited extent to war veterans and Indians, through the performance of useful public work in connection with the conservation and development of the natural resources of the United States, its Territories, and insular possessions.

The companies of the CCC have an authorized strength of approximately 200 men. In June 1939, there were, in all, 1,500 companies distributed in all sections of the United States. The organization of a CCC company is similar to that of a company or unit of similar size in the Army. Selected members of the company have a rating and receive extra pay as "leaders" and "assistant leaders". These men assist the company commander much as noncommissioned officers assist their commanders in Army units. Leaders and assistant leaders also hold such positions as storekeepers, stewards, cooks, assistants to the educational advisers, medical assistants, truck and ambulance drivers, and mechanics. More than half of these leaders and assistant leaders are assigned to the project superintendents to act as foremen of working parties. The monthly pay of enrollees without rating is $30, of assistant leaders, $36, and of leaders, $45. Enrollees with dependents are required to allot part of their pay to the support of those dependents.

The work projects of the CCC are not conducted under the Army but under the direction and supervision of project superintendents and other personnel of the Department of the Interior and the Department of Agriculture. The work includes many types of activity. The CCC protects the forests of our country by fighting fires, clearing firebreaks, building lookout towers, and constructing telephone lines. In the first 6 years of its existence, the corps built 4,000 such fire towers and strung 75,000 miles of telephone lines through the forests to connect them. Planting and seeding young trees, thinning out forest stands of trees to improve growth, and collecting seeds of trees are other important forestry activities. Up to the beginning of 1939 the CCC had planted about 1,800,000,000 trees. The corps fights tree and plant disease, also, and the insect pests that kill trees. To reach its forest work readily, and to enable fire-fighting groups to reach fires quickly, the CCC had built 132,000 miles of road up to the beginning of 1939.

The protection of land against wearing away by rains and floods is another important work of the CCC. In its first 6 years the corps built 5,000,000

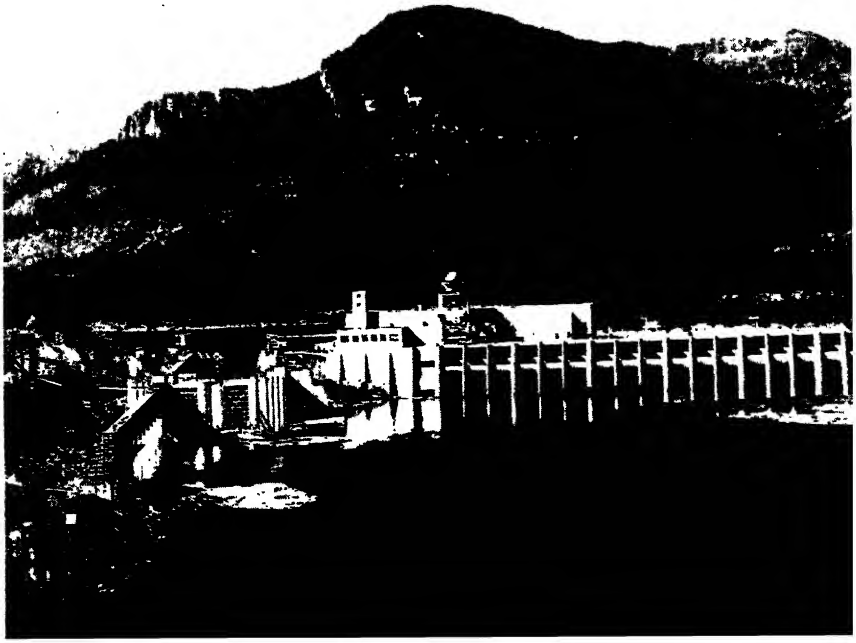
check dams to stop soil erosion and to cause gulleys already wearing deep in the land to fill in again. For flood control, irrigation, and drainage, old channels have been cleared and cleaned, new channels have been dug, and pipe lines have been built. Other projects of the CCC include improvement and development of national and State parks, stocking fish in streams and lakes, and building dams to develop lakes and ponds; building water supply systems; estimating stands of timber; preventing destruction of crops by rats and mice; surveying and mapping, and unearthing historical and ancient ruins.

The Civil Activities of the Corps of Engineers

Our Government undertakes public works for the common benefit of the Nation. Many of these works involve construction on a big scale, and expenditure of large sums of money appropriated by Congress. Among the most important of such works are those to improve the rivers and harbors of our country for navigation, and to extend our system of flood control and at the same time furnish water power and water for purposes of irrigation.

Many of our public works are planned and directed by officers from the Corps of Engineers of our Army. During the years of our national expansion, the Corps of Engineers surveyed boundaries, conducted nearly all the preliminary explorations, constructed roads and trails leading to the West, built bridges and canals, and surveyed and mapped the new lands.

Bonneville Dam, Oreg.



had been completed and no maintenance was necessary, or because they had not been begun since sufficient funds were not yet available for construction. These projects will be undertaken eventually if funds for them are appropriated by Congress.

Though the Engineer Department undertakes many kinds of projects other than those involving the rivers, lakes, and harbors of our country, "river and harbor" and "flood control" projects make up the bulk of the work. During the year that ended on June 30, 1939, the amount expended on rivers and harbors was about $117,500,000, and on flood control, about $81,500,000, a total of over $199,000,000.

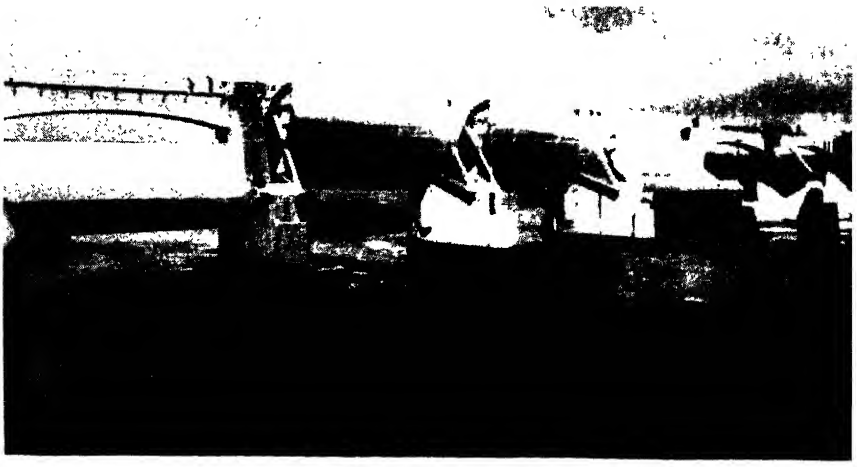
The improvement of waterways in rivers and harbors is a branch of engineering that requires special skill and experience. Much of such work is not spectacular and lies forever hidden below the surface of the water. Only the ship's captain who moves his ship in safety through once hazardous channels appreciates in full the scope and benefits of such work.

In rough figures the commerce of our country carried in boats and ships that navigate our rivers and harbors was, in one recent year, as follows:

	Tons of shipping	*Value*
Foreign commerce	104, 000, 000	$8, 900, 000, 000
Coastwise shipping	149, 000, 000	5, 600, 000, 000
Inland waterways	313, 000, 000	5, 500, 000, 000
Intraport, lakewise, etc., not included above	17, 000, 000	1, 000, 000, 000
	583, 000, 000	21, 000, 000, 000

This enormous amount of business is, of course, the main reason why large sums are spent each year to maintain and improve the rivers and harbors through which this commerce moves.

Many important river and harbor projects were under way early in 1939. The Cape Cod Canal was being enlarged to a depth of 32 feet and a width of 500 feet so that much larger ships than before could pass through it. The Government bought this canal from private owners for $11,500,000, and is spending more than $20,000,000 besides to improve it. The project included the building of three large bridges over the canal, all of which clear the water by 135 feet. Improvements in and around Boston Harbor are costing the Government about $20,000,000, and consist of enlarging and extending channels, and building seawalls to protect them. Similar improvements in New York Harbor and in the waterways around Manhattan Island have already received appropriations of $65,000,000, and will require about $8,000,000 more to finish. The improvement of the New York State Barge Canal from the Hudson River to Oswego, N. Y., on Lake Ontario, is a project involving about $27,000,000, which has been



Clinton, Iowa, dam on the Upper Mississippi.

allotted to the State of New York. The State owns and operates this canal. Its department of public works has charge of the construction, and Army engineers supervise the work. This project covers an important waterway 184 miles in length, which is used for the cheap transportation of grain and other products from the Great Lakes across New York State to New York City and other points. The improvements in the canal enable barges 300 feet long to be used in this commerce. Another large canal project is that of the Chesapeake and Delaware Canal which has cost about $31,000,000.

In the South, the new 30-foot channel leading from the Atlantic Ocean into Jacksonville, Fla., for which $18,000,000 has been appropriated, will permit much larger ships to come in to this port than in the past. On the Sabine-Neches Waterway in Texas, some $22,000,000 is being spent, and $4,000,000 more will be needed, to complete a project which will enable ships of deep draft to reach railroad and highway terminals some distance inland from the Gulf of Mexico.

In the Middle West, improvements on the Illinois Waterway form an important project involving more than $35,000,000. This project covers a canal stretch 325 miles long and will greatly increase the movement of commercial water transportation in its region. Improvement of the upper Mississippi channels by construction of 26 locks and dams had, up to June 30, 1938, involved $215,000,000 in appropriations, and other large sums had been expended upon other sections of the river.

Two very important works carried on in 1939 under the direction of the Corps of Engineers were in the West—the dams at Fort Peck, Mont., and Bonneville, Oreg. The purpose of the Fort Peck Dam on the upper Mis-

souri River is to improve navigation along 770 miles of that river by controlling its flow of water, especially during floods and low-water periods. The estimated cost of this project is $123,000,000. The dam is mainly built of earth; it is the largest of its type in the world. It is nearly 4 miles long and is 250.5 feet high. It is more than half a mile wide at its base and 100 feet wide on top. The reservoir behind the dam containing the waters it controls is 189 miles long and 16 miles wide, and has a shore line of 1,600 miles. The dam was not built to furnish electric power or water for irrigating surrounding lands, but has future possibilities along these lines.

The project at Bonneville, Oreg., on the Columbia River, included not only the building of a great dam but also a power plant, locks for ships to pass, and even fish ladders so that salmon can climb around the falls by easy jumps from one level of water to another to reach their breeding grounds farther up the Columbia. The estimated cost of this project, more than three-quarters completed by the first of 1939, was $75,000,000. The dam is of reinforced concrete and is 1,230 feet long and 170 feet high. The ship lock is 500 feet long and 76 feet wide with a 26-foot depth of water and will lift the ships that use it 66 feet. This is the highest lift of any lock yet built. The powerhouse has room for at least 10 units of 43,200 kilowatts each, but only 2 are being installed for the present.

These are a few of the most striking among the river and harbor projects directed by the Corps of Engineers, but there are also a number of projects under way whose main purpose is flood control. Flood-control projects involve inland and sometimes coastal waterways as some of the works do already described. In fact there is no close line of distinction. Much work which has for its main purpose the improvement of navigation on our lakes, canals, and rivers must necessarily involve the control of floods. Likewise, projects that are undertaken for controlling floods often include the improvement of navigation. For example, the work of flood control along the Ohio River and the streams that flow into it, the scene of damaging floods in past years—work for which the Government had authorized the expenditure of over $190,000,000 exclusive of specific authorizations for projects on tributaries—includes the construction of dams. Another $200,000,000 has gone into navigation improvement in the Ohio, and the total of work completed and planned for on the tributary streams of the Ohio also runs into the hundreds of millions, including one dam on the Tygart River in West Virginia which cost over $18,000,000 to complete.

One valuable service of the Engineer Department to the business of our country is the collection of statistics regarding the commerce on our waterways. In the office of each district engineer, figures are continually compiled to determine the kinds, quantities, and value of all commercial shipments made on our waterways and coming into our ports. These are

published each year in a book available to all interested businesses. Certain special reports are also published, one of importance being the "Port Series," which describes in 32 volumes the commercial and transportation facilities at 100 of our ports and terminals. This particular series has also the purpose of encouraging and promoting the development of adequate installations at our ports. Some volumes of this series are used as textbooks in transportation courses in colleges and universities.

The Corps of Engineers has many other nonmilitary duties in addition to those just described. It administers the Federal laws which govern the granting of permits for structures and operations on navigable streams, and thus determines whether proposed bridges will obstruct too greatly the shipping on such streams and sees to the establishment of reasonable toll rates. It passes also on the location and plans for dams, dikes, and causeways, and for the alteration of obstructive bridges. It removes sunken vessels dangerous to navigation, establishes regulations for the use of navigable waters and for the operation of drawbridges, and administers the law prohibiting the emptying or dumping of refuse of any kind into navigable waters and the pollution of coastal waters by oil. It makes investigations and studies of beach erosion in cooperation with State authorities. The Engineer Corps also grants leases and licenses for the use of property under its control and does much of the engineering work of all kinds for the District of Columbia, especially with regard to the water supply of Washington. It makes studies for the preservation of Niagara Falls and supervises the use of water by the power companies that divert water from the falls. It submits reports of international boards on power-plant operations which affect streams and lakes along the boundary between our country and Canada.

The Panama Canal

Congress has given the President all executive authority for the protection, maintenance, operation, sanitation, and government of the Panama Canal and Canal Zone. The Secretary of War acts as the President's representative in exercising this authority. Responsible directly to the Secretary of War is the Governor of the Canal Zone who resides in the zone and governs it. All Governors of the Canal Zone, up to the time this book was written, have been officers selected from the Corps of Engineers for this important civilian post, appointed for a term of 4 years by the President, by and with the advice and consent of the Senate.

The principal assistants to the Governor are the Engineer of Maintenance, also appointed for 4 years from the Corps of Engineers, and the Marine Superintendent, appointed for a like term from the United States Navy. There are a few other officers of the Corps of Engineers and the Navy detailed to other administrative posts in the Canal Zone government, and

the heads of the Canal Zone hospitals and many members of the staffs of these hospitals are officers of the Medical Department of our Army. An officer of the United States Public Health Service is in charge of the Quarantine Service of the Canal Zone.

The government of the Canal Zone, however, is a civilian and not a military government. The Governor and the officers of the Army, Navy, and Public Health Service under him are, in effect, loaned for the purpose of operating and maintaining the Canal Zone and the Canal. By far the greater number of Canal Zone officials and employees are civilians, and on June 30, 1939, these totaled about 14,800. The officials of the Canal Zone include many of the authorities found in a State or county government in the United States—judges (who are under the Department of Justice), police officials, school and postal authorities, and the like. There are also many officials with engineering and similar duties connected with the operation of the Canal. All Canal Zone officials are appointed and none are elected.

The Panama Canal extends generally southeastward from Colon on the Atlantic Ocean to the city of Panama on the Pacific, a distance from deep water to deep water of 50.7 miles. The width of its channel varies from 300 to 1,000 feet, and its depth is 45 feet. The six locks are each 1,000 feet long and 110 feet wide, and are arranged in pairs so that ships can pass. All locking and pumping operations required are controlled by electrical means.

In the year ended June 30, 1939, 7,481 ships passed through the Canal paying more than $23,500,000 in tolls. The net revenue from the Canal itself was about $14,500,000 for the same year, which is slightly less than 3 percent on $508,000,000, the net capital investment of our Government in the Panama Canal after deducting about $32,350,000 for depreciation up to 1939.

The Governor of the Canal Zone is also the president of the Panama Railroad Co. The line of this railroad parallels the Canal, connecting the cities on the Atlantic and Pacific sides. This is also a profitable investment of our Government. In the year ended June 30, 1939, it paid profits of nearly $1,500,000.

These business figures, however, do not take into consideration the high value of the Canal and the railroad to our national defense, a value that can hardly be reckoned in terms of money. The Canal forms the one passage through which the ships of our Navy can be rapidly transferred from one ocean to another, and thus assembled to operate against the sea forces of an enemy in defense of either of our main coasts.

The defenses of the Panama Canal Zone, and the troops stationed in the zone to guard the Canal, do not come under the Governor, but under the

Commanding General of the Panama Canal Department. In case of war or other emergency conditions dictated by the best interests of national defense, the President has the power to place an officer of the Army in full command over the Canal and the whole Canal Zone as well as the troops within it. In this event, the government of the zone and the Governor immediately come under the authority of the commanding general.

By legislation passed early in 1939, Congress authorized and appropriated funds for considerably enlarging the Canal Zone defenses.

The Alaska Communication System

The Alaska Communication System is a peacetime activity of the Signal Corps. It consists of 21 radio stations in Alaska itself and the net control station at Seattle, Wash. In addition, serving as feeders to the system, there are about 200 privately owned and operated radio stations in canneries, mining camps, logging camps, and isolated communities throughout Alaska. At many places school teachers, who are employed by the Department of the Interior, operate radiotelephone sets, which make contact with the stations of the Alaska Communication System.

Operating this radio system there are 4 commissioned officers, 2 warrant officers, and 187 enlisted men of the Signal Corps, and 40 civilian employees. In addition to handling communication with Alaska, the control station in Seattle connects with the War Department radio net at San Francisco so that Government messages originating in Alaska or Seattle can reach Washington, D. C., or other points in the United States where Army radio stations are located. Congress appropriates from $160,000 to $200,000

Gatun Locks, Panama Canal.

Air Corps photo laboratory.

per year to operate and maintain the Alaska Communication System. This sum does not include the pay and allowances of the military personnel.

The traffic handled by the system in the year ended June 30, 1939, totaled approximately 18,000,000 words. Of this amount, about one-third was Government traffic and the rest commercial. The number of weather messages was several hundred per day in 1939. During special airplane flights in Alaska as many as 1,000 weather messages have been handled in a single day.

The system provides complete commercial telegraph service. Its earnings are turned back into the United States Treasury. Commercial messages originating in Alaska for points other than Seattle in the continental United States are transferred to commercial wires at Seattle.

The equipment of the Alaska Communications System is valued by the Signal Corps at about $1,500,000, including the Seattle station.

The importance of Alaska to our national defense increases continually. The Alaska Communications System, operated by the Signal Corps of our Army, is the sole link of rapid communication with this distant Territory of the far North. Its value in time of peace is unquestioned. In time of war it might well become vital in its importance.

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Coast Artillery railway units passing in review in Hawaii.